DOCUMENT RESUME

ED 271 587 CE 044 690

AUTHOR	Twitty, Robert
TITLE	Method Study. Supervising: Technical Aspects of Supervision. The Choice Series #33. A Self Learning Opportunity.
INSTITUTION	Northern Regional Management Centre, Washington (England).
SPONS AGENCY	Manpower Services Commission, London (England).
REPORT NO	ISBN-0-948023-70-8
PUB DATE	86
NOTE	114p.; For related documents, see ED 266 310-312, ED 268 236-263, ED 270 592-593, and CE 044 689-693.
AVAILABLE FROM	Northern Regional Management Centre, Derwent House, Washington New Town, Tyne and Wear NE38 7ST, England ($15.00 plus postage; 15% discount on 50, 25% on 100; includes audiotape).
PUB TYPE	Guides - Classroom Use - Materials (For Learner) (051)
EDRS PRICE	MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS	Adult Education; *Evaluation Methods; *Job Performance; *Personnel Evaluation; *Personnel Management; Postsecondary Education; *Supervisory Methods; *Supervisory Training

ABSTRACT

This student guide is intended to assist persons employed as supervisors in learning how to apply the principles of method study in the workplace. Discussed in the first three sections are the following topics: understanding the principles of method study (method study procedures and ways of helping the work team feel comfortable with the method study concept); selecting and recording; and examining, developing, installing, and maintaining. Each of these sections contains an introduction, instructional text that is interspersed with reinforcing learning activities, and a section summary. The fourth part of the guide includes a series of performance checks (an end check, a tutor check, and a work-based project). A unit review, which also includes a description of related extension courses and resources, concludes the guide. (MN)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

FD271587

An Open Tech Project

SUPERVISING

TECHNICAL ASPECTS OF SUPERVISION

33: Method Study

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

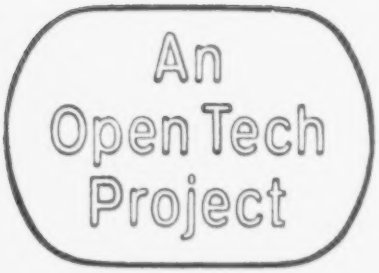
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL IN MICROFICHE ONLY HAS BEEN GRANTED BY

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

33: METHOD STUDY

Robert Twitty



The CHOICE programme is an Open Tech sponsored project managed by the Northern Regional Management Centre in conjunction with the Northern Consortium of Colleges and the National Examinations Board for Supervisory Studies.

© Crown Copyright 1985 Published by permission of the Controller of Her Majesty's Stationery Office.

ISBN 0 948023 70 8

First published in the U K - 1986

Northern Regional Management Centre
Derwent House, Washington Town Centre
Washington, Tyne & Wear NE38 7ST

This Work was produced under an Open Tech contract with the Manpower Services Commission. The views expressed are those of the authors and do not necessarily reflect those of the MSC or any Government Department.

All rights reserved. No part of this book may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording or by any information storage and retrieval system, without permission in writing from the publisher.

Robert Twitty
Method Study (Number 33 in the CHOICE SERIES of learning units)

Series Editor: Harry V Pardue
Northern Regional Management Centre.

CONTENTS PAGE

PART A WHAT IS METHOD STUDY?

1. Introduction 2
2. What is method study? 2
3. Method study procedure 7
4. Method study, the supervisors and the workteam 9
5. Summary 13

PART B SELECT AND RECORD

1. Introduction 14
2. Select 14
3. Record 21
4. Recording Techniques 26
5. Summary 71

PART C EXAMINE, DEVELOP, INSTAL AND MAINTAIN

1. Introduction 72
2. Examine 72
3. Develop 87
4. Install 90
5. Maintain 91
6. Summary 93

PART D PERFORMANCE CHECKS

1. End Checks 94
2. Tutor Check 94
3. Work-Based Project 102

PART E UNIT REVIEW

1. Return to objectives 103

2. Extensions 104

3. References 105

WORKING GUIDE TO THIS UNIT IN YOUR DEVELOPMENT PROGRAMME

This Unit is now your personal property - it's not for handing back to your training officer or to a tutor. It is your working book.

The Contents will increase in value to you each time you write on one of its pages. This is a working text for your personal notes - without notes its value is limited.

Qualifications forget about certificates and diplomas - you don't need them for this programme. What you do need is the wish:-

* to do your job better
* for personal development

Your study time is really up to you - we guess you will need about 8 hours in total. But it's your time - spend as long as you like.

How am I doing? you can judge for yourself by checking out how well you cope with the tasks we call Activities and Self Checks which occur throughout the unit. You can also get the Tutor Check and/or the Work Based Project to your tutor for an unbiased view of your progress.

Work Pace it's really up to you and depends on your interest. However, if you do well on the Activities and Self Checks, you could afford to speed up a little. Of course, if you don't do as well as you expect then you could slow down a little or flick back into the unit for a quick review of the more difficult ideas.

When in doubt - ask or seek help from:

* your family and friends
* colleagues at work
* your company training staff
* other open learners
* your tutor, by phone, by a visit to your support centre or by dropping your tutor a line through the post.

Don't worry if what you learn doesn't seem to be of use to you now, remember that times change - it may be useful one day. Anyway, just knowing more improves personal confidence.

So now make a start:-

33: METHOD STUDY by Robert Twitty

ABOUT THIS UNIT

As supervisor you are largely responsible for ensuring that jobs or processes are done efficiently so that production targets are met. You may also have a say in how your workplace is set out e.g. where people sit or stand and who works beside whom. In this unit we will be looking at ways in which method study can help you to do these things effectively.

IN THIS UNIT WE WILL:

* discuss the purpose and importance of method study.
* examine how to select a suitable area of work for investigation.
* examine the main recording techniques involved and show how to properly collect information at the workplace.
* show how to critically examine the information collected and how to make sound decisions when faced with alternative ways of doing things.
* examine ways to develop improvements, install new methods and maintain the benefits.

AUDIO TAPE Side 1

Before you continue through the unit, you should listen to side 1 of the audio tape that accompanies the unit. You will find it useful if you refer to the unit objectives shown below whilst you listen to the tape. You may wish to make the objectives clearer to yourself by making a note or two on the page as you listen.

OBJECTIVES

When you have worked through this unit you will be BETTER ABLE to:

* understand what method study can achieve
* evaluate the benefits of using method study
* use the basic techniques of method study for investigating and solving problems
* identify how method study can help you in your work as a supervisor.

PART A WHAT IS METHOD STUDY?

1. Introduction

Method study is concerned with HOW things are done. The techniques which it uses can be applied in any workplace - a factory, a hospital, a department store or a farm, for instance. It is usually closely linked with Work Measurement which is concerned with HOW LONG it takes to do something. So you would use Method Study techniques to help you determine a method which is effective and reduces costs and will probably be able to identify the improvement by measuring the time taken to do the job. Method Study and Work Measurement together make up Work Study - with one other important element.

The human aspect is also a most important part of Work Study. The subject consists just as much of human relations - ie problems of communication and persuading people to co-operate - as it does of techniques.

EXTENSIONS 1 and 2 page 104

There are a number of books on Method Study which you might try but I think you'll find these two particularly useful if, having worked through the unit, you want to take your study further.

When you have worked through this unit you should find that you can more easily identify problems, which may crop up in your workplace, and tackle them yourself in a systematic way. However, there are also bound to be occasions when the problem is outside your control and you need to call in a work study officer - if a work process is suspect or there is a major problem of organisation for example. Either way, as supervisor, you will be involved in the method study procedure and an understanding of method study should help you to do your part more effectively.

2. What is method study?

Let us start by thinking about what we mean by method study.

REFERENCE 1 page 105

The British Standard Glossary of Terms Used in Work Study (BS 3138:1979) defines method study as:

> "The systematic recording and critical examination of ways of doing things in order to make improvements."

ACTIVITY 1
Time Guide
3 mins

Think about this definition carefully and jot down:

* what you think method study sets out to achieve

* how it does it

  * _____

  * _____

You may have decided that method study sets out:

TO MAKE IMPROVEMENT

and you would be partly correct, but to make improvement to what? Careful study of the definition tells you that method study sets out to:

MAKE IMPROVEMENTS TO THE WAY WE DO THINGS

You would set about achieving improvements by

SYSTEMATICALLY RECORDING AND CRITICALLY EXAMINING THE WAYS OF DOING THINGS.

2.1 Improvements

Let us consider for a moment how we can show that the method we propose to use will actually be an improvement on what we are currently doing. Suppose you are responsible for planting out young trees in plantations. You have thought of a new method which you think would be quicker and would probably mean that more trees survive planting. But how can you show that your new method would actually be an improvement?

ACTIVITY 2
Time Guide
2 mins

Complete the following statement with suitable words.

In order to show an improvement you have to be able to _____

and _____ the present method with the proposed method.

It is unlikely that we would all answer this in exactly the same way. You may have used words like 'assess' or 'measure', 'determine' and match up' or 'compare' to complete the statement.

My response would have been:

In order to show an improvement you have to be able to measure and compare the present method with the proposed method.

When we measure a piece of material or paper or something we may do it in feet or metres, when we measure an athletes' performance we do it on the time he took or the height he jumped or whatever; when we measure how much profit we made this year as opposed to last year we do it in money.

Whatever we are concerned with, we have to have some term in which to measure - length, speed, time, money etc.

ACTIVITY 3
Time Guide
5 mins

Think about your own workplace. Jot down two ways in which you would be able to show that a proposed method of doing something was an improvement on the present method. I've entered one suggestion to get you started.

* by comparing the amount of work involved in the existing and proposed methods.
* _____
* _____

There are various ways in which one can show an improvement. Your responses may have included some of the following:-

* by comparing the cost of doing the existing and proposed method
* by comparing the time it takes to do the existing and the proposed method
* by comparing the manpower used to do the existing and the proposed method
* by comparing the amount of materials used to do the existing and the proposed method
* by comparing the amount of work done by an item of plant, a machine or item of equipment in the existing and proposed method

All these responses have one thing in common. They all suggest improvement in the use of available resources. Whatever your job as a supervisor in charge of a workteam is, you will have the responsibility to make efficient use of production resources. And these resources are:

THE WORKTEAM

EQUIPMENT

MATERIALS

SPACE

ACTIVITY 4
Time Guide
2 mins

Jot down the four main production resources that you as a supervisor have available for doing a job.

* _____
* _____
* _____
* _____

I would hope that we can all agree that the FOUR main production resources at our disposal for doing a job are the workteam, the equipment you use, materials and hand (SPACE).

Therefore:

TO MAKE IMPROVEMENTS IN THE WAY WE DO THINGS

can mean

TO MAKE IMPROVEMENTS IN THE WAY WE USE RESOURCES.

2.2 Productivity

EXTENSIONS
1 and 2
page 104

This responsibility for the effective use of resources means that we're concerned with productivity, which is a term we'll find used frequently in Method Study. Before we go any further, let's work out exactly what it means.

Output is the end product - what we actually get as a result of the effort and materials which have been put into the job. We might measure this in terms of the number of sales made, the number of letters typed or the volume of sheet steel produced. Whatever our job, there is an output.

Input is the resources (workteam's time, use of equipment and materials) which are put into the job.

Productivity is the ratio between output and input, in other words, how much we are producing in relation to how much is being put in.

So an improvement in the use of resources will result in an improvement in productivity.

Method study helps to identify ways in which we can improve productivity by getting

MORE OUTPUT FOR THE SAME INPUT OF RESOURCES

or

THE SAME OUTPUT FOR A REDUCED INPUT OF RESOURCES.

If we put a money value to this, I think we can agree that this would result in a reduction in costs which in turn may lead to an increase in profits and wages.

SELF CHECK 1
Time guide
2 mins

Complete the following statements with a suitable word or group of words.

a) Method Study aims to make _____ in the way we do things.

b) Improvements depend upon a better use of _____.

c) You measure an improvement by _____

_____

d) _____ is the ratio of output to _____ of resources.

e) Resources which supervisors are responsible for are likely to include _____, _____, _____ and _____.

The answer to this self check is here in the following words so you will have to check your answers carefully. a) Method Study aims to make improvements in the way we do things, which depend upon b) a better use of resources. c) Improvements are measured by comparing existing methods with proposed methods. To show an improvement, you have to show an increase in productivity using the proposed new method. d) Productivity is the ratio of output to input of resources. e) Resources which you are likely to be responsible for include the workteam (labour), equipment, materials and space.

3 Method study procedure

EXTENSION 1
page 118

Now let us consider the procedure for achieving improvements.

ACTIVITY 5
Time guide
2 mins

Underline what you think are the key words in the following definition which describes the method study procedure.

> The systematic recording and critical examination of ways of doing things in order to make improvements.

The words I would underline are systematic recording and critical examination.

The word systematic is important because it indicates that method study is carried out and achieves improvement by following a DISCIPLINED APPROACH.

So what is that 'disciplined approach'?

ACTIVITY 6
Time guide
3 mins

The disciplined approach of method study can be broken down into six basic steps which I've listed below but I haven't put them in the right order.

Arrange the steps in the correct order by filling in the step beside the appropriate step number. I've entered in one step to get you started.

List of steps

Develop	Step 1 _____
Select	Step 2 _____
Examine	Step 3 _____
Install	Step 4 DEVELOP
Maintain	Step 5 _____
Record	Step 6 _____

The disciplined approach of method study involves the careful selection of the work which can be studied to some advantage; the systematic recording of the relevant facts about the work being done; the critical examination of the relevant facts; the development of an improved method, the installation of the improved method into practice and finally the maintaining and possible further improvement of the practice.

So our six basic steps should be in this order

Each of these steps will be considered in detail in part B and C.

You have seen that method study is essentially concerned with finding better ways of doing things and it contributes to improved efficiency by getting rid of unnecessary work, reducing costs, labour input, materials input and/or machine input.

ACTIVITY 7
Time guide
1 min

Suppose you are going to carry out a method study. Underline one of the following statements which states clearly the facts you would record and examine.

a) Record and examine the facts as they should be.

b) Record and examine the facts as they might be.

c) Record and examine the facts as they are.

d) Record and examine the facts as somebody says they are.

I hope we can agree that statement c) is the only correct response.

Record and examine the facts as they are. At this stage you do not have an opinion about the facts, you merely find out which are the relevant facts and record them in a systematic way: then critically examine the recorded facts.

You would then develop from the examination of the relevant facts the best answer possible under the circumstances.

4 Method Study, the Supervisor and the Workteam

As a supervisor you may feel that you and your workteam have been working hard and doing your job well so why should you use method study to try to improve the way you're doing things? Worse still, why should somebody else, such as a work study engineer, investigate how work in your section is carried out?

It's not uncommon for people to feel resentful or suspicious if a work study investigation is suggested and to feel that the very idea is a personal criticism and the result can only be bad news for them.

ACTIVITY 8
Time guide
4 mins

Jot down two fears which you think somebody might feel if, without being prepared, they are faced with a work study investigation into the way work is done in their section.

* _____

_____

* _____

_____

Your response to this activity may well be coloured by your own experience so we're likely to have said different things. However, these are common fears which are often expressed before an investigation.

* The status of the job may be lowered if it's made easier.

* Future prospects for the workteam may suffer.

* Jobs may be lost or earnings reduced.

* An investigation will disrupt a comfortable situation at work.

* Other people will have too much say in what the workteam is doing.

Usually, these fears are groundless and, in worrying about what can go wrong, people tend to lose sight of the possible benefits.

A positive attitude of mind towards an investigation is as important as a knowledge of the techniques. A half-hearted approach is no use. As a supervisor it's important that you really want to produce results and have the determination to see it through.

Method study is, after all, a tool of management, not a weapon to be used against you or your workteam. And, like any other manager, you can learn to use it to your workteam's advantage and to help you all to do your jobs more effectively.

So what is in it for you?

ACTIVITY 9
Time guide
4 mins

Spend a few minutes thinking about the possible benefits which could arise for you, as supervisor, from a work study investigation in your workplace. Jot down two suggestions.

* _____

_____

* _____

_____

The possibilities are varied. Here are some which come immediately to my mind.

* The job may become easier or more interesting which will increase job satisfaction.

* The contribution which you and your workteam make may be better recognised.

* Solutions may be found to problems you've been putting up with for a long time.

* Working conditions may be improved.

* You may be able to supervise more efficiently as a result.

* You may learn some new information and acquire some new skills as a result.

* Chances of promotion may be increased depending on how effective is your contribution to the investigation.

Several of these benefits apply equally to the workteam as well as to you, but they probably need to be 'sold' to the workteam.

As supervisor, it's you who has to do this although, of course, before a full-scale investigation is carried out by work study engineers, consultations should have taken place with the union and you and your workteam should have been informed by management of what is proposed.

So how do you encourage your workteam to cooperate and take a positive attitude to an investigation?

ACTIVITY 10
Time guide
5 mins

Suppose a method study investigation is to take place in your section the week after next. Agreement has been reached with the union and everybody has received a memo informing them of the investigation from the manager. Jot down three things which you would do before and during the investigation to make sure the workteam supported it.

* _____

* _____

* _____

You may have thought of all sorts of things. I think they can broadly be summed up like this.

* Give as much information as you can about the investigation.

* Explain in simple terms everything that is happening and why.

* Emphasise the benefits.

* Encourage the workteam to make suggestions for improvements themselves.

* Give them plenty of opportunity to talk through their fears and misgivings.

How successful the investigation is, in your section, depends to a large extent on your understanding and cooperation and your ability to encourage a cooperative and positive response from your workteam.

Let's finish this part of the unit with a self check.

SELF CHECK 2
Time guide
5 mins

Complete the following statements with a suitable word or group of words.

a) Method study is concerned with _____ a job is done.

b) Workstudy is made up of Method Study and _____ _____.

c) _____ _____ are also an important aspect of Work Study.

d) Method study provides a _____ source of information about a job.

e) Method study takes a _____ approach to a problem.

f) The six basic steps of Method Study are

_____

_____

_____

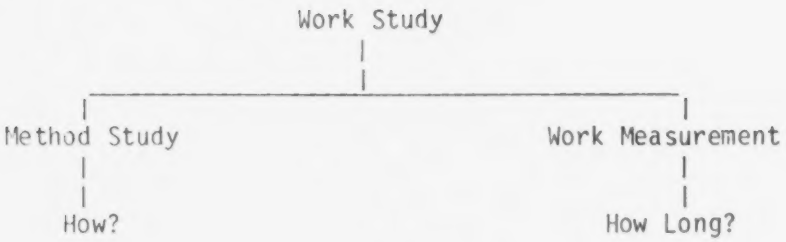
_____

_____

_____

The answers to this self check are here in the following words so you will have to check your answers carefully. a) Method Study is concerned with how a job is done. b) How long the job takes is the concern of Work Measurement which is the other approach which makes up Work Study. c) However, human relations are as important an aspect as either of these two disciplines. d) Method Study provides a reliable source of information about a job because e) it uses a disciplined or systematic method of collecting and evaluating information. f) The six basic steps of Method Study are select, record, examine, develop, install, maintain. If these produce the outcome expected, the result should be higher productivity.

5 Summary



Method study is

The systematic recording and critical examination of ways of doing things in order to make improvements.

Improvements are measured by comparing the existing and proposed methods.

Improved method results in increased productivity.

Productivity is the ratio of output (end product) to input (resources used).

The six basic steps of Method Study:

SELECT
RECORD
EXAMINE
DEVELOP
INSTALL
MAINTAIN

Method Study may benefit the supervisor and the workteam by providing:

increased job satisfaction

easier and more efficient supervision

better working conditions

improved job security

easier work

less fatigue

To ensure the cooperation of the workteam:

tell them whenever an investigation is to be carried out

explain in simple terms everything which will be done

emphasise the benefits

encourage suggestions on improvements

allow them to talk about their misgivings or objections.

PART B SELECT AND RECORD

1 Introduction

We have seen that the systematic approach of method study can be broken down into the following six steps.

MAINTAIN

INSTALL

DEVELOP

EXAMINE

RECORD

SELECT

EXTENSIONS 1 and 2 page 104

In this part of the unit we will study in more detail the first two steps SELECT and RECORD. If you want to take your study even further you might like to read R M Currie's or D Whitmore's book on the subject.

2 Select

The first step in method study is to select work which can be studied to advantage. This usually means that we need to define the problem and state the results we expect to achieve. The word 'problem' does not necessary mean that there is a difficulty or that you have trouble. In most jobs, there are other ways of doing things and aspects of the job which could be improved, so to that extent we can regard any job as a problem.

REFERENCE 1 page 105

BS 3138:1979 defines 'select' as

"the process of choosing by systematic means a specific problem to be solved or an area of work to be studied".

ACTIVITY 11
Time guide
3 mins

I have just said that all jobs are a problem. As a supervisor you will from time to time have to make the following decisions regarding the jobs you are responsible for or, in other words, to have dealt with all these problems.

Complete the following list of problem areas by writing in the missing words in the spaces provided. I've completed the first statement to get you started.

* Where the work will be done.
* _____ the work will be done.
* _____ the work will be done.
* _____ will do the work.
* _____ is to be done.

As a supervisor you will need to decide:

where the work will be done (place);

how the work will be done (means);

when the work will be done (sequence);

who will do the work (person);

what is to be done (purpose).

In any of these areas you need to consider whether it's worth investigating the methods used.

ACTIVITY 12
Time guide
2 mins

Suppose there's a problem in your work area which you're considering investigating. Whether you do or not will depend on how you weigh up various considerations.

Jot down two considerations you might take into account.

* _____
* _____

You could have mentioned all sorts of things. Here are a few possibilities.

* Do you have time?

* Would it be worthwhile in terms of any savings you might make?

* Is the problem one which you can do anything about?

These considerations were just selected at random but there is a more systematic way of doing it.

EXTENSION 3
page 104

R G Seabourne explains the work should be selected for investigation after the

economic considerations
technical considerations
human considerations

have been taken into account.

Let's look at each of these in turn.

Economic Considerations

The main reason for a company to be in business is to make profits. It does this by making the most efficient use possible of its resources.

SELF CHECK 3
Time guide
2 mins

Jot down the main production resources that you as a supervisor have available for doing a job.

* _____

* _____

* _____

* _____

The answers to this self check are here in the following words so you will have to check your answer carefully. We've mentioned these resources earlier in the unit. Whatever your job, the four main resources at work are the workteam, equipment, materials and space.

Any improvements are likely to be in reducing costs in any of these areas or in increasing productivity for the same costs.

At the end of a suitable period, your section's actual costs can be compared with budgeted costs and variances analysed. If your costs are too high then this would be a good reason for selecting that area of work for a method study.

But there are still other considerations concerning cost to be made.

Don't forget that:

the investigation itself costs time and money

the lifetime of all methods and machines is limited. It may not be worth carrying out an improvement in a process which will not be used much longer

the benefits in one area may be so small that the time and energy needed for an investigation would be better used elsewhere.

ACTIVITY 13
Time guide
5 mins

Bearing these considerations in mind, look at the following situations and decide whether you would select them for investigation by writing YES or NO in the box beside each one:

a) budgeted costs less than actual costs, potential savings more than cost of method study and expected life of project is long term ____

b) actual costs slightly more than budgeted costs, cost of method study slightly less than potential savings and expected life of project is long term ____

c) actual costs more than budgeted costs, cost of method study less than potential saving, machine due to be scrapped within months ____

I hope we can agree that it would be worthwhile carrying out an investigation for a). On the other hand, on economic considerations, b) looks doubtful. Although the actual costs are slightly more than the budgeted costs and the expected life of the project is long term, the potential savings do not appear to make it worthwhile.

Similarly, I don't think I would select c). Although savings could be made the machine is due to be scrapped anyway and the time and energy needed for an investigation could probably be better used elsewhere. Of course, if there doesn't seem to be another suitable problem to investigate, one might think again.

Technical considerations

The usual reason for wanting to change the method of doing something is that it will reduce production costs. Method study is essentially concerned with finding better ways of doing things and it contributes to reduced production costs by getting rid of unnecessary work, avoidable delays and other forms of waste. This is achieved through -

* improved layout and design of factory, plant and workplaces
* improved working procedures
* improved use of material, plant and equipment and manpower
* improved design or specification of the end product.

ACTIVITY 14
Time guide
4 mins

Suppose you work in a factory and a new production line has been set up which you supervise.

It soon becomes apparent that production costs are higher than budgeted, production output is low and your workteam are unable to earn the expected take home pay.

Bearing in mind the four technical areas we've just mentioned in which you would look to make improvements, jot down three possible problems which may be causing the poor productivity.

I'll suggest one to get you started.

* Material wastage - the workteam may be using the wrong material or using expensive material carelessly.
* _____
* _____
* _____

Even though you don't need to work in a factory to do this activity, it's likely that your response will reflect your own experience so we're all likely to have thought of different things. However, here are a number of possibilities: perhaps your suggestions are among them.

* poor equipment usage - the workteam may be using the wrong tools or using equipment wrongly; equipment may not be properly maintained

* poor layout of workplace - this may mean materials are handled more than once unnecessarily or things may have to be moved frequently or over an unnecessary distance

  the workplace may be congested and the workteam getting in each other's way

* poor organisation - if work is not properly planned and organised there may be a delay between finishing one job and starting the next

  shortages of materials or equipment may occur if work isn't properly planned and scheduled

* poor use of the workteam - two people may be doing a job which only needs one or one may be trying and failing to do a job which is more than one person can manage.

Any of these factors and many others would be a technical consideration and would influence your decision to select this problem for further investigation.

Human Considerations

Even though the economic and technical considerations may indicate that a particular problem should be the subject of a method study, human considerations have to be taken into account. If there is a history of troubled relationships in a particular section or if, for example, the possibility of an investigation is mishandled, the reaction of the workteam may be very hostile.

In that case, management would have to weigh up the merits of the original case against the possible damage an investigation could provoke. It may well be thought better to leave it for the time being.

(This, incidentally, emphasises how critically important it is to keep the workteam informed and to encourage them to take a positive attitude to a method study investigation.)

SELF CHECK 4
Time guide
3 mins

We have looked at method study and the workteam in Part A. With this in mind complete the following statement by writing in the missing words.

The workteam may not give an investigation their full support because of their fear of losing _____, losing _____, and having to _____ _____.

The answer to this self check is here in the following words so you will have to check your answer carefully. It may be different from mine but still emphasise the point. The workteam may not give an investigation their full support because of their fear of losing status, losing overtime/money and having to work harder. You, as supervisor, have a lot of 'selling' to do.

On the other hand, the working conditions in a particular workplace may be so undesirable that this factor alone would be sufficient reason for a study to be made in order to improve conditions, irrespective of economic or technical considerations.

ACTIVITY 15
Time guide
3 mins

Think of a job which strikes you as really hard because of the working conditions. Jot down two examples of what you think are meant by 'undesirable conditions'. I've given one example to get you started.

* excessive lifting and movement of heavy loads
* _____
* _____

Here are some suggestions, your response may be amongst them.

* unsafe working areas
* cramped working conditions due to unnecessary clutter
* bad lighting and ventilation
* untidy work areas due to badly sited stockpiles or unnecessary rubbish obstructing work
* working without shelter.

Any situation that constitutes a safety hazard should be the concern of supervisors and management and warrant a method study.

Remember

METHOD STUDY can contribute to improved efficiency through IMPROVING THE WORKING ENVIRONMENT.

3 **Record**

Once you are satisfied that Step 1 - Select The Work to be Studied - has been done satisfactorily you are ready to learn more about the work situation itself in its entirety. This means recording all the relevant facts.

RECORD THE RELEVANT FACTS.

REFERENCE 1 page 105

BS 3138: 1979 defines RECORD as

"the process of setting down information acquired during an assignment".

SELF CHECK 5
Time guide 1 min

Jot down one word which will describe the approach you should adopt when recording the work being done.

* _____ APPROACH.

You may have responded to this self check with 'disciplined', 'logical' or 'methodical' approach. Each of these would be correct but the word we used in Part A was SYSTEMATIC.

Systematic recording involves following a plan and using some special techniques. Work Study Officers use well-tried and accepted 'Recording Techniques' to ensure that they record all the relevant facts in a single and standardised way. They use charts and diagrams specially designed to give a clear picture of the work in question and to highlight its defects and point the way to possible ideas of improvement.

ACTIVITY 16
Time guide 3 mins

Suppose you are going to observe exactly how a job is being done and record the facts as you see them.

Jot down two methods you would use to record the information

eg write notes as you observe

* _____

* _____

There are several possibilities here. Let's look at some of them.

* written notes - this is time-consuming, can cover a lot of paper if it's complicated and isn't standardised. You may not describe things in quite the same way each time.

* tape recorder - useful because you can make notes at the same time as you are observing but the information still has to be transferred to paper in some form before it's of use to somebody else.

* video camera or photographs - useful because you can look at what happened as often as you need. It can even record work while you are doing something else. In very slow or repetitive processes time-lapse photography which takes one frame at set time intervals may be used as well.

* shorthand or symbols - using some kind of shorthand or standard symbols means that you can quickly record detailed information in a standardised way. We need a series of symbols to represent the different kinds of activity involved in doing a job.

Before we go on to look at these symbols let's first determine the different kinds of activity which are involved in any job.

ACTIVITY 17
Time guide
3 mins

I suggest that it is possible to describe all the work done in your workplace in terms of FIVE different types of activity. Jot down, in the space provided, the name of each type of activity. I've given you a clue with an example for each type.

1 erecting scaffolding _____

2 checking safety guard on machine _____

3 storing goods in a warehouse _____

4 waiting for instructions _____

5 moving material from the store to a machine _____

The examples given illustrate the activities 1) Operation 2) Inspection 3) Storage 4) Delay and 5) Transport. You may have used different words to describe the five activities (for example 'check' instead of 'inspection' or 'movement' instead of 'transport') but I hope you will agree that these five activities can be used to describe all the work done in your workplace.

ACTIVITY 18
Time guide
3 mins

There are many examples of each type of activity. Here are a few more for you to consider. Jot down in the space provided one other example for each type.

1 OPERATION

opening a door
starting an engine
reading an instruction
unloading a wagon
nailing timber together
typing a letter

* _____

2 INSPECTION

checkweighing the weight of material
comparing sales ledger with receipts
trial run of a machine after repair
measuring the size of a component

* _____

3 STORAGE

letter on file
goods on shelf
fuel in tank

* _____

4 DELAY

waiting for a machine to be prepared
a power failure
standing in a queue
waiting for materials

* _____

5 TRANSPORT

hoist going up
letter being taken from one office to another
materials being moved
operator going to stores

* _____

You should appreciate by now that

- an operation is any action deliberately made in order to advance a stage towards a desired result
- an inspection involves either checking, testing or comparing the result of an operation. The product remains unaltered by an inspection otherwise it would be an operation
- storage involves removing the material or product from production and putting it into storage
- delay is similar to storage only this time some circumstances prevent the performance of the next planned activity for a short time only
- transport involves movement from one place to another.

In order to make a clear presentation of the facts and to enable the mind to grasp them quickly and clearly, we find it useful to use symbols instead of the words OPERATION, INSPECTION, STORAGE, DELAY and TRANSPORT.

ACTIVITY 19
Time guide
3 mins

The symbols used are recognised internationally and are shown below. Match the symbols with the activities by writing the name of the activity in the space provided alongside the symbol you think most appropriate. I've filled in one to give you a clue.

	Symbol	Activity
1		_____
2		_____
3		_____
4		_____
5		storage _____

The symbols and activities match up like this.

transport

delay

inspection

operation

storage

You were probably able to see the reason for some of them - like for delay for instance - but it doesn't matter if you guessed wrongly at this stage. Spend a moment or two trying to memorise these symbols because we'll be using them a lot.

One more important thing to remember - if it is difficult to separate two activities such as operation and inspection then the symbols may be combined, like so.

SELF CHECK 6
Time guide
5 mins

Complete the following statements by drawing the appropriate symbol after each activity and by filling in the missing words in the spaces provided.

* AN OPERATION ( ) is performed by an OPERATOR or on a MATERIAL.
* AN INSPECTION ( ) is performed by an _____ or on a MATERIAL.
* A DELAY ( ) holds up an OPERATOR or a _____.
* A TRANSPORT ( ) is movement of an _____ or of a _____.
* A STORAGE ( ) is only of a _____.
* AN OPERATION and INSPECTION ( ) is performed by an _____ or on a _____.

The answers to this self check are here in the following words so you will have to check your answers carefully. * An operation (○) is performed by an operator or on a material. * An inspection(□) is performed by an operator on a material. * A delay (D) holds up an operator on a material. * A transport (⇨) is movement of an operator or of a material. * A Storage (▽) is only of a material. * An operation and inspection (◎) is performed by an operator or on a material.

4 Recording Techniques

Now that we know the symbols to use let's look at some of the recording techniques which you might find useful if you want to improve efficiency in your workplace.

4.1 Process Charts

A good starting point is to look at the ways in which we can record the steps in the procedure or production process only. This involves using one of the PROCESS CHARTS, which we will look at shortly and two or more symbols to show the sequence of activities in the process for the three main production resources.

SELF CHECK 7
Time guide
2 mins

Do you remember what the four main resources at work are? Jot them down in the space provided below.

* _____
* _____
* _____
* _____

The answers to this self check are here in the following words so you will have to check your answers carefully. The four main resources at work are labour (the workteam), equipment, materials and space.

We can use a process chart to monitor what happens to each of the first three resources in any process.

Let us look at a MAN TYPE CHART which, not surprisingly, records what the person carrying out the task is doing.

ACTIVITY 20
Time guide
3 mins

Let us follow through the work of a secretary typing a letter dictated by the manager.

A manager dictates a letter on to tape. The secretary is called in the manager's office to collect the tape. She returns to her own office, places the cassette on the transcribing machine, chooses appropriate stationery, checks the typing set and then types the letter, with one copy and the envelope. After checking the letter she places it with the copy and envelope in a folder and returns to the manager's office to wait for the letter to be signed. She returns to her own office, places the letter in the envelope and puts it in the 'out tray'. She files the copy of the letter.

Study the account of the secretary's work. Jot down in the space below, with the symbol alongside, the first and last activities.

The first activity	Symbol
* _____	_____
The last activity	**Symbol**
* _____	_____

The first activity in the process from the secretary's point of view is the secretary responding to the manager's call to go into his office to collect the tape. This activity involves travel and would be shown thus.

To manager's office.

The last activity in the process is the secretary filing the copy of the letter. This activity is an operation and would be shown thus.

File copy of letter.

ACTIVITY 21
Time guide
5 mins

Now think about the process in full and complete the partly completed process chart below by filling in the miss ng words or symbols. Remember it is just the activities of the secretary you are concerned with this time.

PROCESS CHART

PROCESS:	Secretary typing letter dictated by Manager.
CHART BEGINS:	Secretary to Manager's office.
CHART ENDS:	Secretary files copy of letter.
CHART TYPE:	MAN TYPE (Secretary).

Secretary →

to manager's office

collects tape

_____

— places cassette on transcribing machine

chooses appropriate stationery

— checks typing set

types letter, with one copy and envelope

_____

_____

— to manager's office

— _____

_____

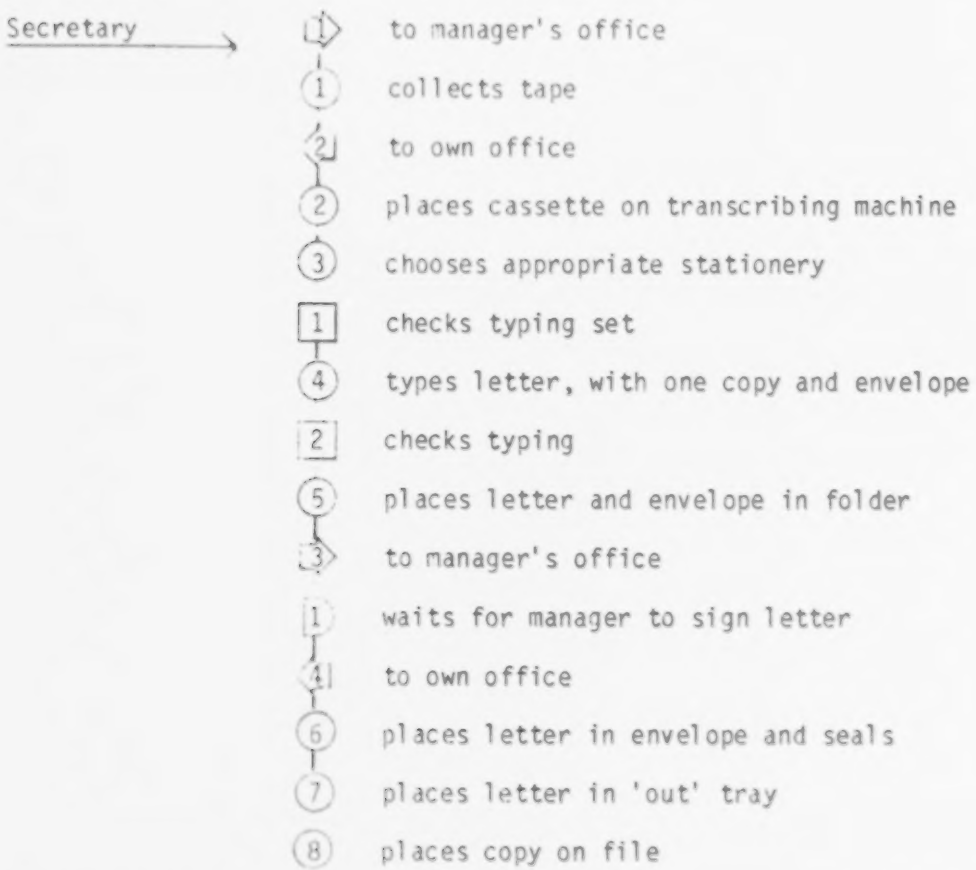
— places letter in envelope and seals

_____

places letter in file.

Here is how I would have completed the process chart for you to compare with your version.

CHART TYPE: MAN TYPE (Secretary)



If you look carefully at the start of the process chart you will notice an arrow ⟶ has been drawn to show the entry of the secretary.

An arrow ⟶ can be used to show the entry of the person, material, or equipment, with a description above the line.

Have you also noticed that I've joined up the symbols with a vertical line and entered numbers in each symbol in sequence?

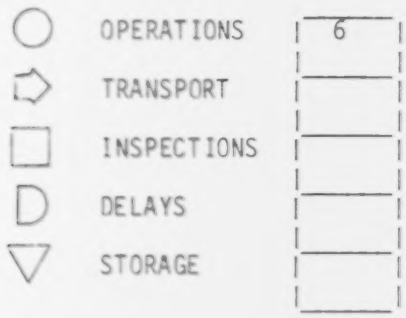
ACTIVITY 22
Time guide
2 mins

Complete your own chart by drawing in the vertical lines and numbering all the symbols in sequence. Check your answer carefully with the chart above.

When the chart is complete it must be summarised. All activities are totalled.

ACTIVITY 23
Time guide
2 mins

Complete the summary for the process chart by writing the number in the boxes alongside the activity. I've completed the first one to get you started.



The completed summary for the process chart showing the work of the secretary is shown below.

SUMMARY

The summary highlights the main features of the task, the number of times movement takes places, inspection and delays occur and how often the material used is stored.

This completes the RECORD stage and the chart is now ready for the next step in the procedure.

SELF CHECK 8
Time guide
1 min

Jot down the name of the step which follows record.

* _____

The step which follows record is Examine and this is described in Part C of the unit.

ACTIVITY 24
Time guide
10 mins

Perhaps you'd like to try a process chart on your own. We said earlier that you can use a process chart to monitor men, materials and machines so now let's try doing a material type chart using the same example of the secretary typing a letter. To refresh your memory, here once again is exactly what happens.

A manager dictates a letter on to tape. The secretary is called into the manager's office to collect the tape. She returns to her own office, places the cassette on the transcribing machine, chooses the appropriate stationery, checks the typing set and then types the letter with one copy and the envelope. After checking the letter she places it with the copy and envelope in folder and returns to the manager's office to wait for the letter to be signed. She returns to her own office, places the letter in the envelope and then puts it into the 'out tray'. She files the copy of the letter.

Now prepare a complete material type Process Chart showing the activities of the contents of the letter. (Ignore copy of letter for this activity.) Start with the contents awaiting dictation by the manager and end with the contents of the letter waiting for post.

Your response to this activity may be slightly different from mine. This is how I would respond.

PROCESS CHART

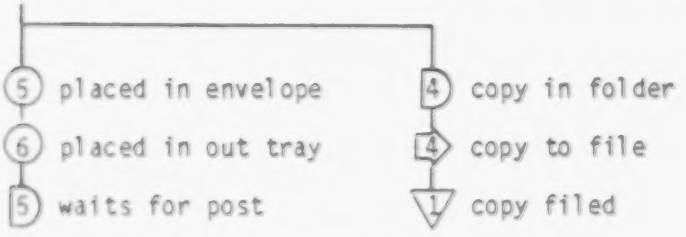
PROCESS:	Secretary typing letter dictated by manager.
CHART BEGINS:	Contents dictated by manager onto tape.
CHART ENDS:	Contents of letter waiting for post in out tray.
CHART TYPE:	MATERIAL (Contents of letter)

Contents of Letter →

Summary	
Operation	- 6
Transport	- 3
Delays	- 4
Inspections	- 1
Storage	- 0
Total	14

1. dictated by manager onto tape
1. waits arrival of secretary
1. to secretary's office
2. wait for secretary to type
2. typed in letter form
3. wait for envelope being typed
1. checked by secretary
3. placed in folder
2. to manager's office
4. signed by manager
3. to secretary's office
5. placed in envelope
6. placed in out tray
4. waits for post

To include 'copy of the letter' in the process chart this would be done as follows.



You might find it useful to try out your skill in recording activities on a process chart by constructing a man type process chart, using all five symbols, for any task at your place of work. Don't tackle anything too complex at this stage.

SELF CHECK 9
Time guide
10 mins

1 Complete the following statements by filling in the blanks.

a) Process charts are used to record the _____ in the procedure or production process _____.

b) A process chart used to _____ the activities of labour is known as a _____ _____ chart.

c) A process chart showing in detail the sequence of the flow of the procedure is known as a _____ _____ _____.

2 Decide whether each of the following statements is true or false.

a) RECORD is the third step in the method study procedure.

TRUE/FALSE

The symbol for storage is

TRUE/FALSE

The symbol for operation is

TRUE/FALSE

3 Using the following symbols illustrate how you would show the entry of the resource and the sequence of the activities in a process chart. Summarise the results.

The answers to this self check are here in the following words so you will have to check your answers carefully. 1 a) Process charts are used to record the steps in the procedure or production process only. b) A process chart used to record the activities of labour is known as a man type chart. c) A process chart showing in detail the sequence of the flow of the procedure is known as a Flow Process Chart. 2 a) Record is the second step in the method study procedure. The symbol for storage is ▽ and the symbol for an operation is ○ .

Summary

○ - 3

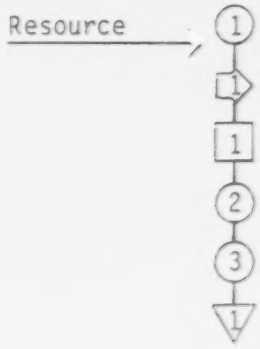
⇨ - 1

□ - 1

D - 0

▽ - 1

Total 6



Symbol connected by vertical lines and numbered to show sequence of activities

Now let's look at other types of process charts and see why and when they would be used. The Flow Process Chart which we've just looked at sets out the procedure in great detail, using all five symbols and presents a very detailed picture of exactly what happens. Sometimes this isn't really necessary and isn't what managers want in any case.

ACTIVITY 25
Time guide
2 mins

Jot down one reason why it may not be necessary to present a very detailed picture of exactly what happens.

* _____

The reason it may not be necessary to present a very detailed picture of exactly what happens is because you may only want a quick appreciation of the situation.

ACTIVITY 26
Time guide
2 mins

In that case, suppose you're just trying to produce a quick appreciation of the situation. You will only need 2 of the 5 symbols to do this. Tick the two which you feel would be necessary to show the overall picture.

a) transport indicates movement of operators, material or equipment

b) operation indicates something is achieved

c) storage indicates stoppage in process

d) delay indicates interference in the process or temporary storage

e) inspection check quality or quantity.

It is of great importance that you always show clearly when something has been achieved and that the quality or quantity has been checked. It's not so important to know that movement has taken place, nor that a stoppage or delay has occurred, so you would just use the symbols ○ and □ .

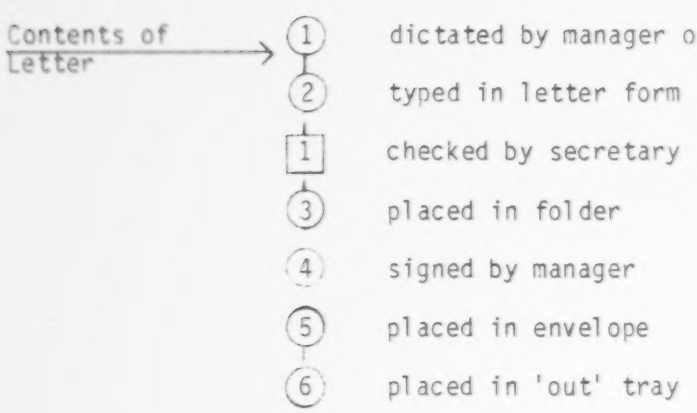
ACTIVITY 27
Time guide
7 mins

Consider the example of the secretary typing the letter dictated on tape by the manager. Construct a material type chart (content of letter) which records only the operations and inspection necessary to perform the task. I've started you off.

PROCESS CHART

PROCESS:	Secretary typing letters dictated by manager.
CHART BEGINS:	Contents dictated by manager onto tape.
CHART ENDS.	Letter placed in 'out' tray for collection.
CHART TYPE.	Materials Type (Contents of letter).
Contents of Letter → (1)	dictated by manager onto tape

Here is how I would complete that chart for you to compare with your version.



Summary

○ - 6

□ - 1

Total 7

This type of process chart gives an overall view of a process by recording all of the major operations and inspections associated with the process and is known as an OUTLINE OR OPERATIONS PROCESS CHART.

SELF CHECK 10 Answer TRUE or FALSE in the space provided to the following question.
Time guide
1 min

The outline process chart does not indicate where work takes place.

TRUE/FALSE

The answer to this self check is here in the following words so you will have to check your answer carefully. The symbol ⇨ is not used in the construction of an outline process chart therefore it is not possible to know if the operation was carried out in the same place or not. The statement is therefore TRUE.

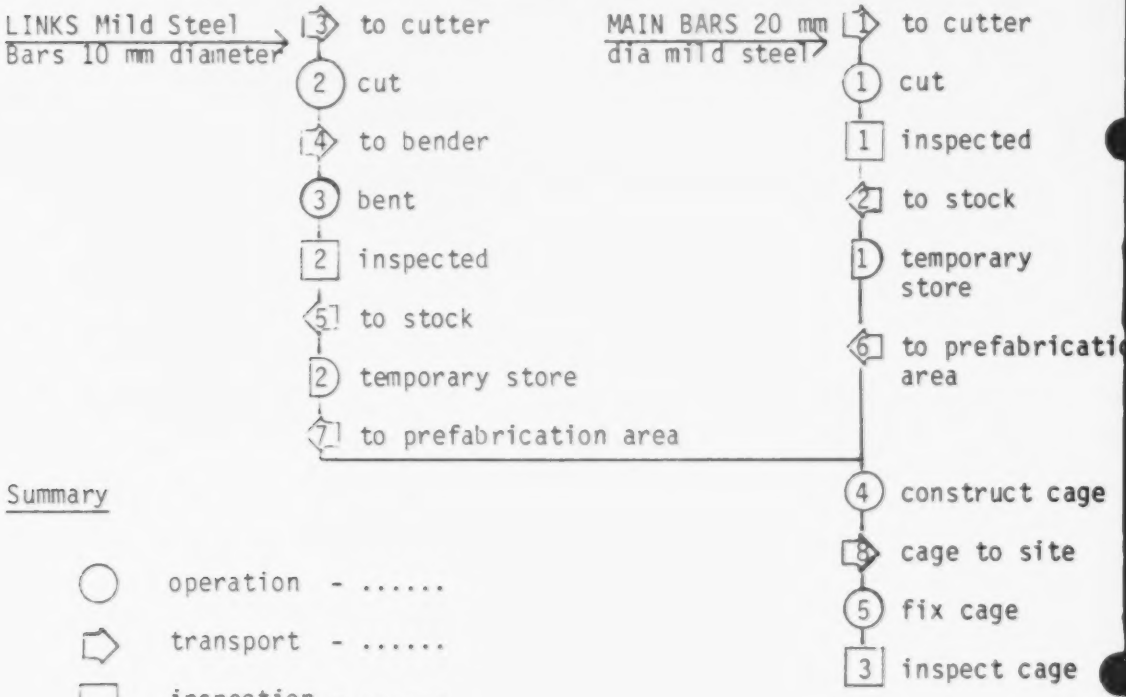
Quite often work involves two or more men or pieces of equipment doing things at the same time. In this case the Flow and Outline Process charts could be used. The resources are presented alongside each other on the same sheet of paper to indicate more clearly their interdependence. It is essential, however that you do not mix up man, material or equipment type charts.

ACTIVITY 28
Time guide
7 mins

Study the following example of a Material Type Flow Process Chart carefully. Complete the summary and then list in correct sequence all the activities as they would take place. I've listed the first four activities to get you started.

FLOW PROCESS CHART

OPERATION - Cut, bend and fix steel reinforcement to column
CHART BEGINS - steel from stack to cutter
CHART ENDS - completed column inspected
CHART TYPE - materials type



Summary

○	operation	.....
⇨	transport	.....
□	inspection	.....
D	delay	.....
▽	storage	.....
	Total	_____

List of activities in correct sequence.

1	Main bars to cutter	10	
2	Main bars cut	11	
3	Main bars inspected	12	
4	Main bars to stock	13	
5		14	
6		15	
7		16	
8		17	
9		18	

Here is my response to that activity.

List of activities in correct sequence.

Summary

- 5

- 8

- 3

- 2

- 0

Total 18

1 Main bars to cutter
2 Main bars cut
3 Main bars inspected
4 Main bars to stock
5 Main bars in temp store
6 Links to cutter
7 Links cut
8 Links to bender
9 Links bent
10 Links inspected
11 Links to stock
12 Links in temporary store
13 Main bars to prefabrication area
14 Links to prefabrication area
15 Construct cage
16 Cage to site
17 Fix cage
18 Inspect cage

A great proportion of the work carried out in factories and offices is confined to a single workplace and consists of the use of hands and arms only. In these situations you need to record not only the sequence but also the synchronisation of movements of each hand. This requires two columns in which you would record the symbols representing the activities of the left hand and the right hand respectively. The columns are interrelated by aligning the symbols on the chart so that simultaneous movements by both hands appear opposite each other. This type of process chart is known as a TWO HANDED PROCESS CHART.

ACTIVITY 29
Time guide
3 mins

The five symbols used in process charts are shown below. Alongside each symbol indicate whether or not the symbol is needed when constructing a two handed process chart. If no, jot down in the space provided the reason why. Remember you're only concerned with what each hand is doing.

Symbol	Response
	YES/NO
	YES/NO
	YES/NO
	YES/NO
	YES/NO

Reason _____

_____

_____

All the symbols except the inspection symbol are used, since this activity is a mental process and does not involve movement of the hands and arms. The storage symbol in this case implies hold.

ACTIVITY 30
Time guide
7 mins

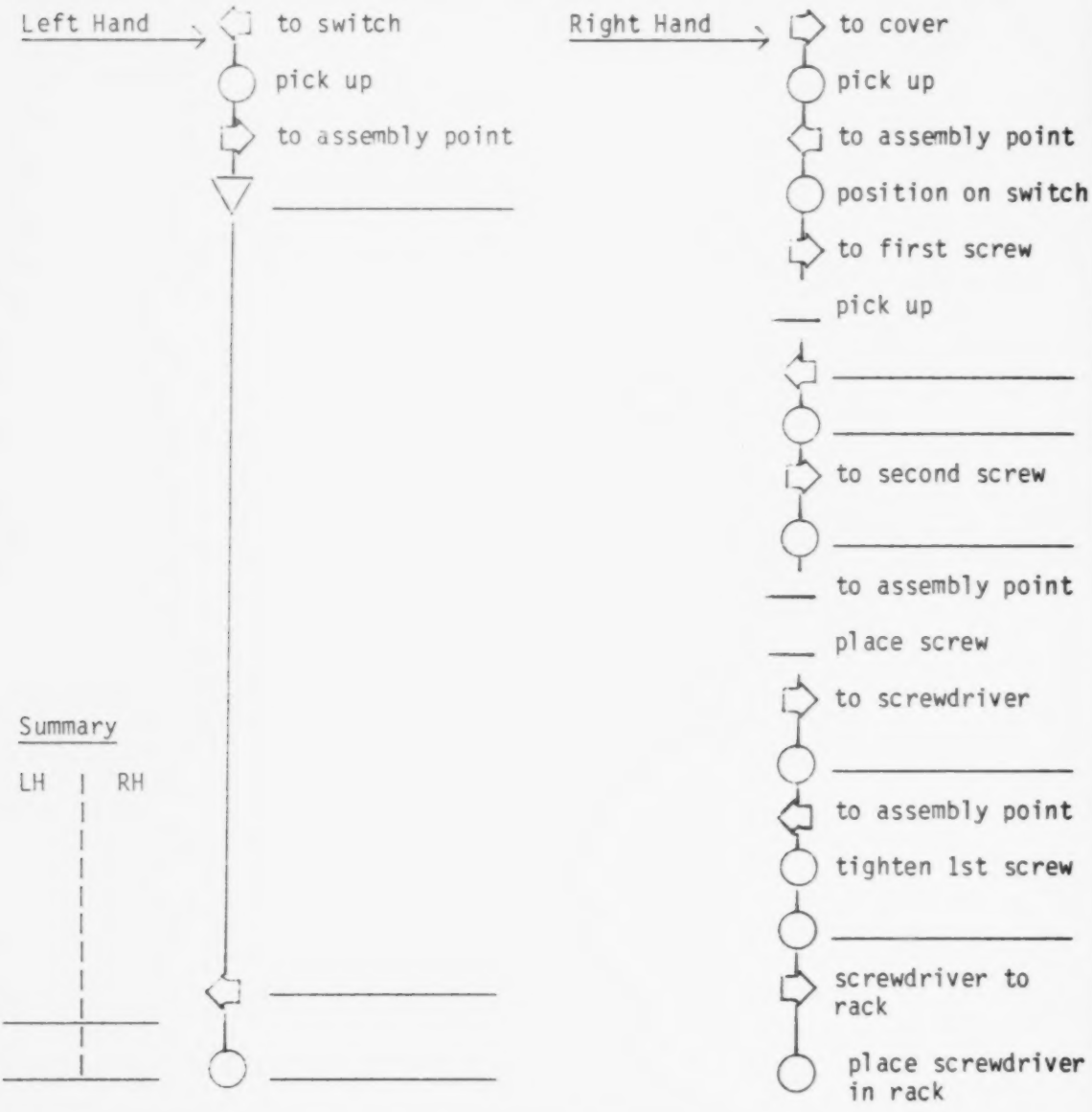
Let us consider the assembly operation 'fitting cover to a switch' and prepare a two handed process chart from the following information.

Left hand picks up switch while right hand picks up cover. Both switch and cover taken to assembly point. Left hand holds switch while right hand positions cover in body and then secures, using a screwdriver and two screws.

I've started you off. Now you complete the blanks on the chart.

TWO HANDED PROCESS CHART

PROCESS: Fitting cover to a switch
CHART BEGINS: Hands empty, switch and cover in boxes, screwdriver in rack
CHART ENDS Completed assembly in box, screwdriver in rack.



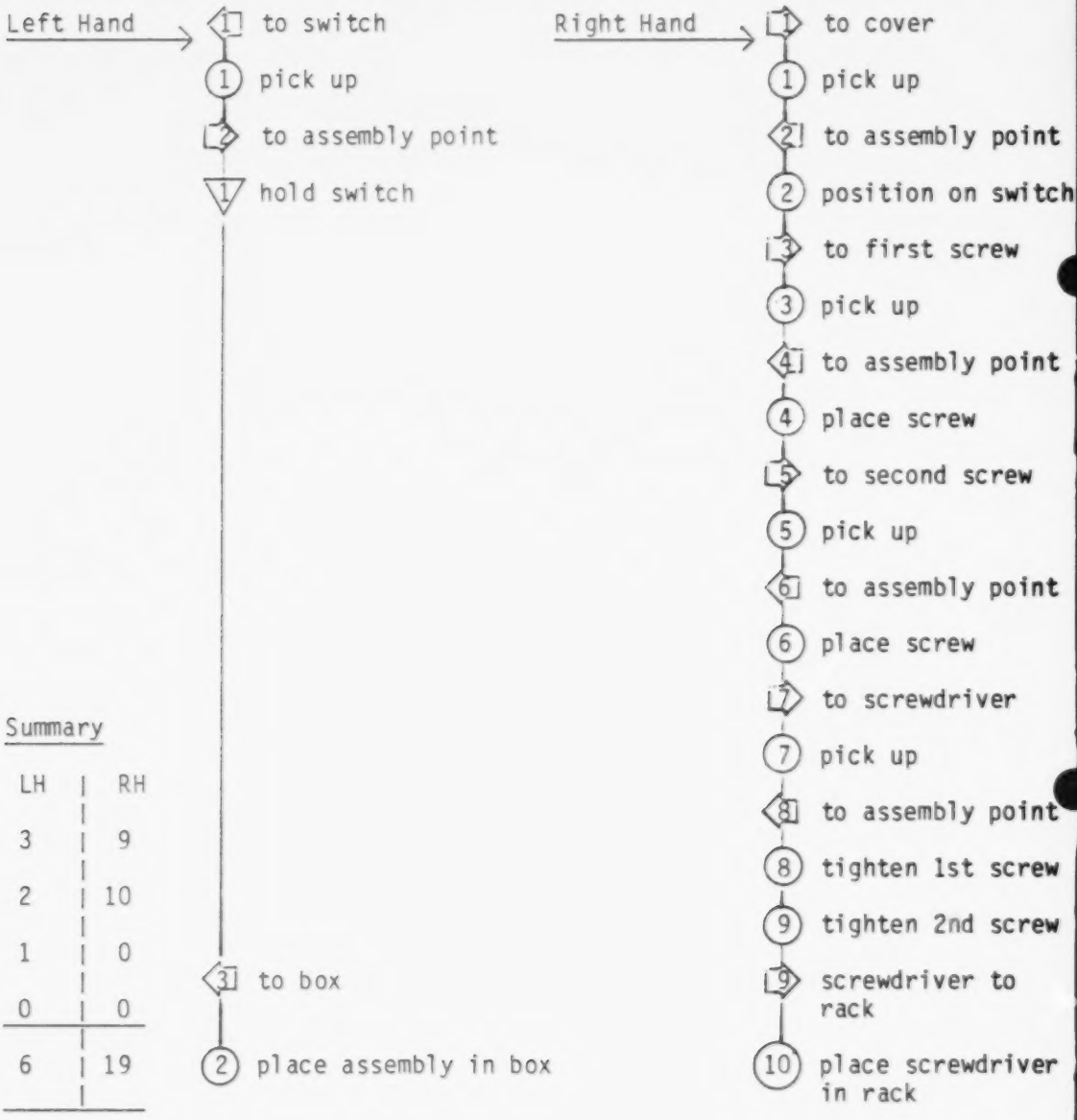
The complete answer to this activity is as follows.

TWO HANDED PROCESS CHART

PROCESS: Fitting cover to a switch

CHART BEGINS: Hands empty, switch and cover in boxes, screwdriver in rack

CHART ENDS: Completed assembly in box, screwdriver in rack.



Summary

	LH	RH
⇨	3	9
○	2	10
▽	1	0
D	0	0
Totals	6	19

The use of two handed process charts is limited mainly due to the fact that neither paths of movement, nor detailed movements of hand and arms are shown. They do, however, help to assess whether the expense of detailed micromotion analysis is justified. This technique is outside the scope of the unit but if you'd like to know more you could take up this extension.

EXTENSION 2
page 104

In the construction of any of the process charts you must always bear in mind that

the FACTS should be accurate and
the PRESENTATION should be clear.

If the chart is not clear then you have not written it effectively.

SELF CHECK 11
Time guide
10 mins

Having heard that you are interested in method study your boss has asked you to recommend the recording techniques you would use to

1

a) provide an overall view of a procedure

b) record work confined to a single workplace and consists only of the use of hands and arms

c) provide a detailed recording of the simultaneous activities of two materials.

Jot down the type of process chart you would recommend in the space below, along with the symbols used with each technique.

	Type of Process Chart	Symbols used
a)	_____	_____
b)	_____	_____
c)	_____	_____

2 Complete the following statements with a suitable word or group of words. I've entered the first letter of each word to get you started.

a) Process charts record the s_____ in the p_____ o_____. They do not show w_____ the work takes p_____ nor the p_____ of m_____.

b) An outline process chart provides an o_____ view of a process, from which it can be d_____ whether or not a further and more d_____ s_____ is needed.

c) The flow process chart provides a d_____ record of a process and expresses the process in terms of the activities as they affect the m_____ being processed, or the process in terms of the activities of the w_____ on the use of the e_____.

d) Two handed process charts provide a d_____ r_____ of the activities and illustrates the synchronisation of the m_____ of each h_____.

e) The two main requirements of any process chart are that the f_____ should be a_____ and the p_____ should be c_____.

f) The recording stage is complete once you have s_____ the information by listing the t_____ for each a_____.

The answers to this self check are here in the following words, so you will need to check out your responses carefully. 1 a) outline process chart ○ □ ; b) Two handed process chart ○ ▽ ⇨ D ; c) Flow process chart ○ □ ⇨ D ▽. 2 a) Process charts record the steps in the procedure (or process) only. They do not show where the work takes place nor the paths of movement. b) An outline process chart provides an overall view of a process from which it can be determined whether or not a further and more detailed study is needed. c) The flow process chart provides a detailed record of a process and expresses the process in terms of the activities as they affect the materials being processed, or the process in terms of the activities of the workteam or the use of the equipment. d) Two handed process charts provide a detailed record of the activities and illustrate the synchronisation of the movement of each hand. e) The two main requirements of any process chart are that the facts should be accurate and the presentation should be clear. f) The recording stage is complete once you have summarised the information by listing the totals for each activity.

4.2 Diagrams

ACTIVITY 31
Time guide
2 mins

In some cases, all the relevant facts can be recorded using one or other of the process charts. But these have their limitations and you may find that you will also need to record facts, other than the steps in a procedure or process. Jot down one example of such a 'fact'. I've started you off with an example.

* Where the activity takes place.

* _____

Other examples of the information you may wish to record are paths of movement, the distance travelled and the time taken for each activity.

To record where an activity takes place and the paths of movement, we need some kind of picture or diagram of the work area. To enable the distance travelled to be measured means that you will have to draw the diagram to scale. The time taken for each activity has to be measured using an ordinary watch or a stop watch. Although work measurement is not being dealt with in this unit it is essential that you need to appreciate the link between method study and work measurement. In deciding whether or not a proposed method is more effective and reduces costs you will often need to measure the time taken to do the work.

SELF CHECK 12
Time guide
3 mins

Complete the following statement by filling in the missing words. I've entered the first letter of each word to help you.

Diagrams are drawn to s_____. They represent the w_____ a_____, showing the p_____ of m_____ of the main production r_____ and are either m_____ or m_____ or e_____ type diagrams.

The answer to this self check is here in the following words so you will have to check your answer carefully. Diagrams are drawn to scale. They represent the working areas, showing the paths of movement of the main production resources and are either materials or man or equipment type diagrams.

SELF CHECK 13
Time guide
2 mins

Remember when we were talking about how to select a problem for investigation we looked at the considerations that should be taken into account when selecting work for method study.

a) Jot down, in the spaces below, the three considerations to be taken into account before selecting work.

* _____ considerations

* _____ considerations

* _____ considerations.

b) Jot down which of the above considerations will indicate problems that will need a diagram to best record the facts.

* _____

The answers to this self check are here in the following words so you will have to check your answers carefully. a) The economic, technical and human considerations need to be taken into account before work is finally selected for method study. b) Technical considerations are those most likely to indicate problems that will need a diagram to best record the facts.

ACTIVITY 32
Time guide
3 mins

Jot down one example of a problem that may occur in your workplace which would best be highlighted by using a diagram to record the facts.

I've thought of one example to help you get started.

* Congestion caused by people or materials crossing the same routes in the office, shop or factory.

* _____

Obviously, what you have said will entirely be a reflection of what happens in your own workplace. Common problems might be:

* people or materials having to move an unnecessarily long distance because of the poor positioning of machines and storage areas

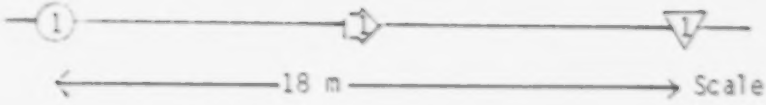
* backtracking - people and materials having to cover the same distance twice or more because of poor layout of the work area.

Either of these would show up clearly on a diagram.

FLOW DIAGRAMS

Let's first look at a diagram which is used to illustrate the flow process chart showing where the activities take place and the paths of movement. The symbols are drawn in the centre of the areas where the activity takes place and are joined together in sequence by a line which represents as nearly as possible the path of movement of people or materials or equipment.

For example



This diagram represents three activities and the path of movement between an operation and storage area. The diagram is drawn to scale. The distance between the operation and storage is measured as 9cm which represents an actual distance of (9 x 2) 18 m.

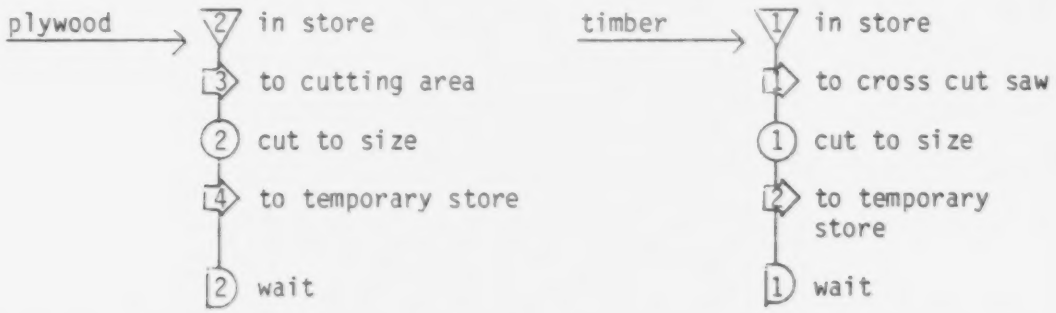
operation - symbol normally drawn in the centre of the area used for operation

transport showing direction of movement between operation and storage. Distance 18m

storage symbol normally drawn in the centre of the area used for storing material.

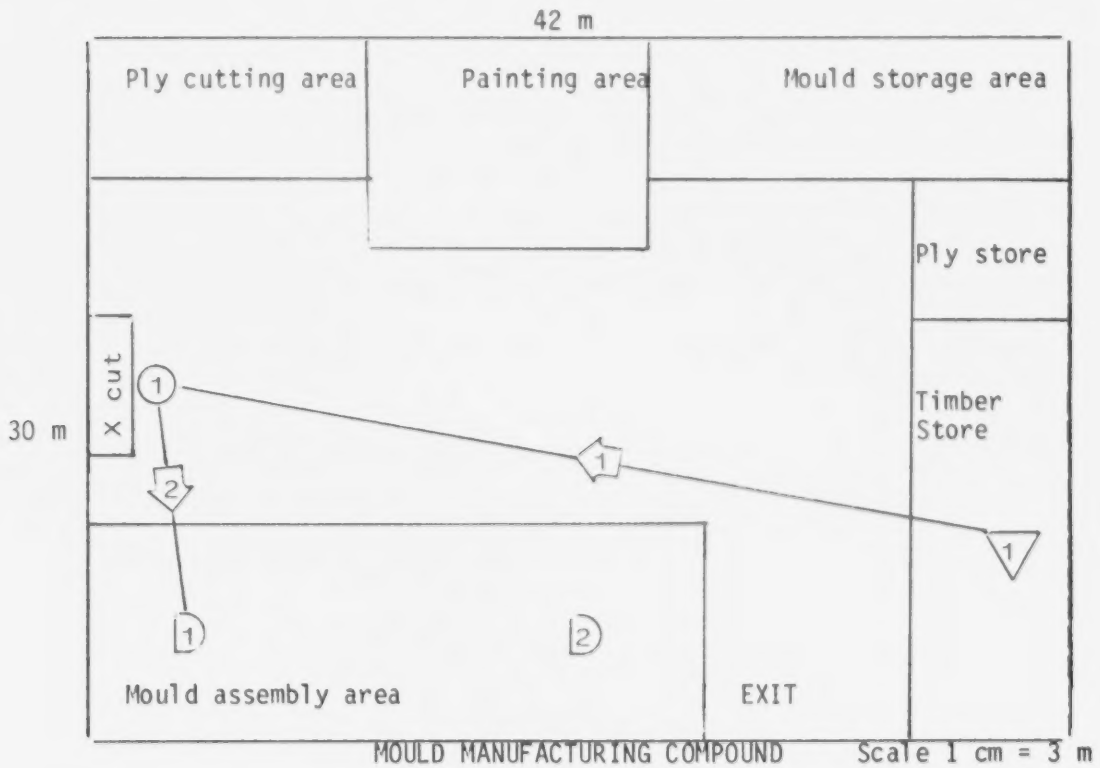
ACTIVITY 33
Time guide
10 mins

Consider for a moment the following part of a flow process chart showing the activities involved in the manufacture of plywood and timber moulds.



Having thought about this part of a flow process chart, study the flow process diagram below. This diagram represents the mould manufacturing compound 42m x 30m drawn to a scale of 1cm = 3m. The timber store, ply store, ply cutting area, mould storage area, painting area, mould assembly area and the position of cross cut saw are all shown and drawn to scale. The FIVE activities for the timber are also shown plus the plywood wait symbol (2).

FLOW PROCESS DIAGRAM (1)

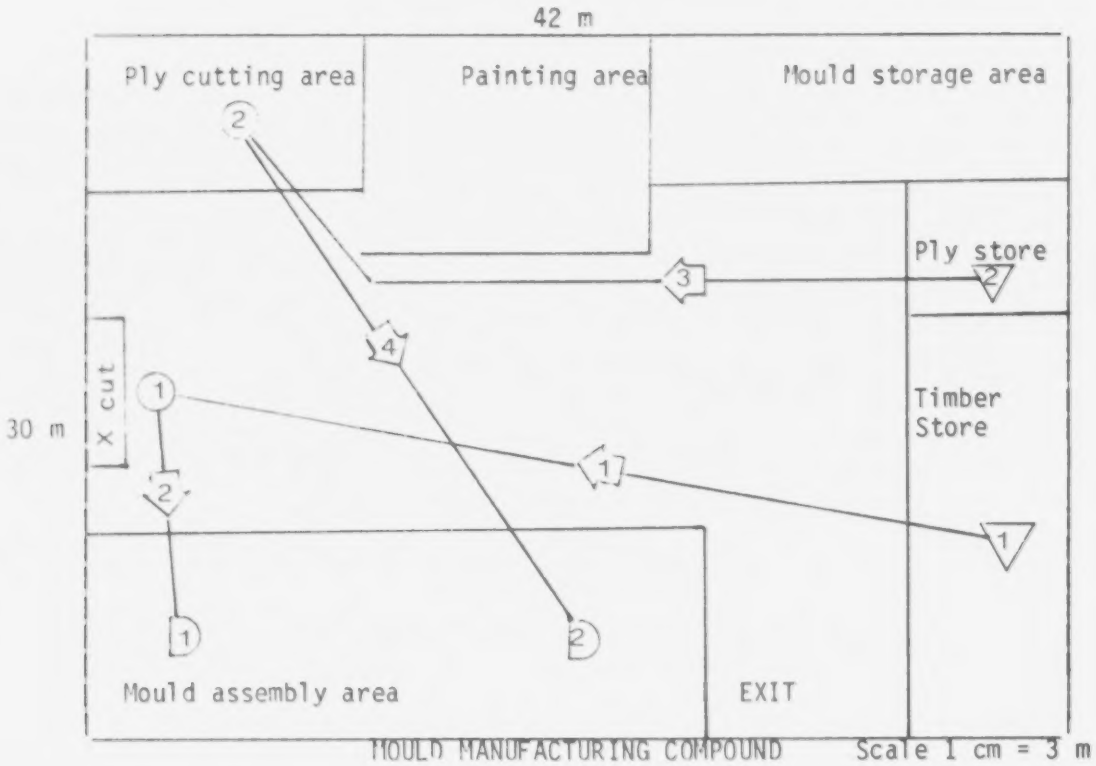


MOULD MANUFACTURING COMPOUND Scale 1 cm = 3 m

Follow through the flow process chart for timber and check that you agree with it. Then complete the activities for 'Plywood'.

The following diagram (2) shows how I would complete the flow process diagram. I hope that you find yours is similar.

FLOW PROCESS DIAGRAM (2)



ACTIVITY 34
Time guide
15 mins

Look at the full flow process chart below carefully, showing all the activities involved in the manufacture of plywood and timber moulds.

Now complete Flow Process Diagram (2), shown above, using all the remaining activities indicated in the Flow Process Chart.

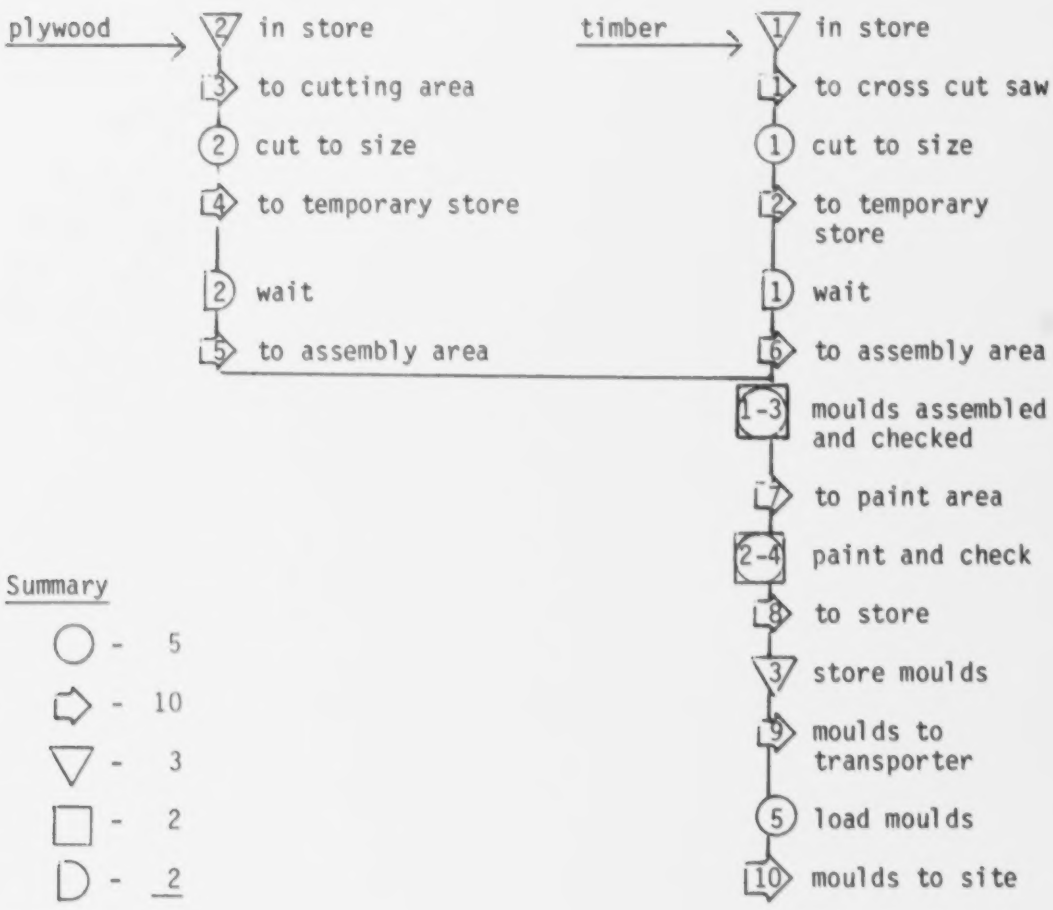
FLOW PROCESS CHART

PROCESS: Manufacture of plywood and timber moulds

CHART BEGINS: Plywood and timber in store

CHART ENDS: Moulds to building site

CHART TYPE: Materials

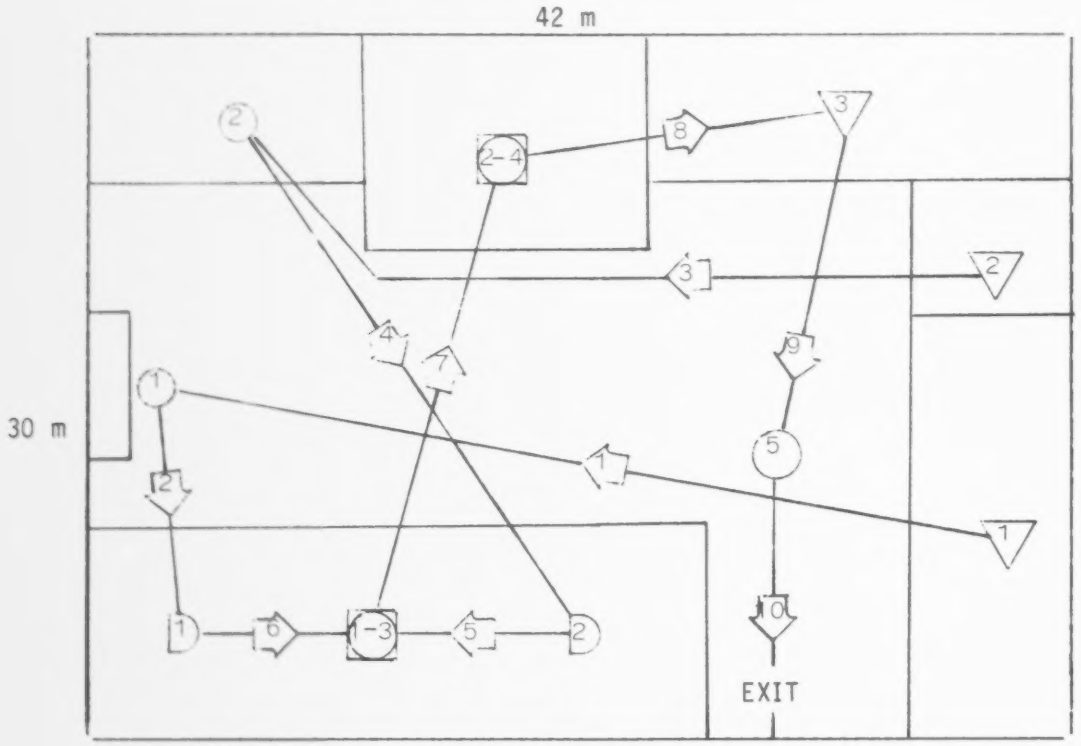


Summary

○	-	5
⇨	-	10
▽	-	3
□	-	2
D	-	2
Total		22

Here is how I would complete that flow process diagram for you to compare with your version.

FLOW PROCESS DIAGRAM (3)



MOULD MANUFACTURING COMPOUND Scale 1 cm = 3 m

ACTIVITY 35
Time guide
5 mins

The total distance travelled by the timber, plywood and completed mould can each be determined by adding together the length of each path of movement. Jot down in the table shown below the distance travelled along each path of movement. I've determined the distance travelled for the timber to get you started. Remember that the diagram is drawn to a scale 1 cm = 3 metres.

Timber

1	12.5 cm	x 3	= 37.5	m
2	3.5 cm	x 3	= 10.5	m
6	2.75 cm	x 3	= 8.25	m
				56.25 m

Plywood

3		x 3	=	m
4		x 3	=	m
5		x 3	=	m
				m

Completed Mould

7		x 3	=	m
8		x 3	=	m
9		x 3	=	m
10		x 3	=	m
				m

Total distance travelled _____ m

Here are my measurements of the path of movement of the timber, plywood and completed moulds for you to compare with yours.

Distance travelled

Timber				56.25 m
Plywood				
	3	12 cm x 3	= 36.0 m	
	4	9 cm x 3	= 27.0 m	
	5	3 cm x 3	= 9.0 m	
				72.00 m
Completed Mould				
	7	7 cm x 3	= 21.0 m	
	8	5 cm x 3	= 15.0 m	
	9	5 cm x 3	= 15.0 m	
	10	4 cm x 3	= 12.0 m	
				63.00 m
Total distance travelled				191.25 m

ACTIVITY 36
Time guide
2 mins

As the supervisor in charge of the mould manufacturing compound, you are concerned that your section is losing money and is not able to meet the production targets. You have completed the recording of the work and the results are shown in the flow process chart and diagram (3) above. Without doing a detailed examination at this stage, jot down one reason which you think may be causing your problem.

* _____

_____

_____

You may have thought of a number of things but I hope we can agree that two of the most likely reasons for the problems in your work area are:

* congestion and bottlenecks caused by the paths of movement crossing

* excessive distances travelled as a result of the poor layout of the work area.

The Flow Process Diagram is a useful tool for showing how people, equipment or materials move round a work area. However, they have limitations and some situations are difficult to show with this type of diagram.

ACTIVITY 37
Time guide
4 mins

Let us assume that in the making of 20 timber and plywood moulds the various paths of movement (Flow Process Diagram 3) were used as follows.

1	10 times	6	20 times
2	10 times	7	20 times
3	10 times	8	20 times
4	10 times	9	10 times
5	20 times	10	1 time

Jot down what you think the Flow Process Diagram would have difficulty in showing in the construction of the 20 timber and plywood moulds and why:

* _____

_____

I hope we can agree that the Flow Process Diagram would not show clearly the number of times the path of movement in the construction of 20 timber and plywood moulds would be used.

If they were all drawn on one diagram, the individual paths would merge into one, making it extremely difficult to decipher the frequency of movement and the total distance travelled.

Nor are they suitable for showing random movement which has no particular purpose related to the actual job being carried out.

So how can you show these things?

ACTIVITY 38
Time guide
2 mins

Using our example of the 20 timber and plywood moulds again, suppose that you wanted to record on a diagram the total distances travelled during fabrication.

Can you suggest one way you could do this?

You may have come up with a number of ingenious solutions to this problem.

One which is commonly used is to use a piece of string or thread to illustrate the paths of movement instead of drawing lines. This type of diagram is known as a string diagram.

String Diagram

To prepare a string diagram you need to:

* prepare a scale plan of the working area and attach it to a piece of softboard

* insert pins through the scale plan where the operations are carried out, storage takes place, delays occur and where changes in direction occur

* attach the stiff thread to the first pin and then wind round the other pins following the exact route taken in carrying out the process. Different coloured thread can be used to show the movement of the different materials or men or equipment.

* the total length of the thread used, related to the scale of the plan, will tell you the length of travel of the people, materials or equipment being studied.

So we've established that the principal uses of string diagrams are to investigate movement.

ACTIVITY 39
Time guide
5 mins

Think about your own workplace for a few minutes. Then jot down two circumstances in which you might find it useful to use a string diagram to measure movement. I've entered one possibility to help you get started.

* When one member of the workteam is tending several machines
* _____
* _____

What you have thought in response to this activity will depend entirely on the sort of workplace in which you work. However, it's quite likely that your ideas fit into one or more of the following broad areas:

* where people make random movements
* where movement of one or several people is along the same path
* where you want to test out and compare a number of different layouts
* where a number of people are involved in working on one process.

Templets

Having just mentioned testing and comparing layouts, it's worth noting that you can save yourself a lot of time and energy here if you use templets made of card or plywood, cut to scale, to represent machinery, work areas and so on. This saves you having to draw a new diagram each time you try out an alternative layout.

SELF CHECK 14
Time guide
3 mins

1 Jot down three different things you can record with Flow Process and String Diagrams. I've entered one for you to get you started.

* where the activities take place
* _____
* _____
* _____

2 The clarity of these techniques makes them particularly useful when considering the following three types of problem. I've entered one problem to get you started. You jot down the other two.

* congestion
* _____
* _____

The answers to this self check are here in the following words so you will have to check out your answers carefully. It does not matter in what order you have listed the answers or whether you have used the same words as me. 1) Diagrams are used to record where the activity takes place; the steps in the process; the paths of movement and the distances travelled. 2) They are particularly useful when considering problems of congestion, layout, bottlenecks and long material runs.

You may be thinking, at this point, that the recording techniques looked at so far are very good in controlled working situations but that they would not be much use to you as a supervisor in a shop, for instance where you want to record the movement of customers. Here your problem would be that you have to record a large number of people, all of whom may be moving irregularly, coming in to the shop at different times and moving in any of a large number of different directions.

The recording technique used in these situations is known as a TRAVEL CHART or a FROM-TO CHART and the emphasis is placed on the movement of a number of items between a group of work stations during a period of time.

ACTIVITY 40
Time guide
4 mins

I've suggested that travel charts could be used to record the movement of customers in a shop but this isn't the only place they might be useful. Can you suggest another example of when they may be useful?

* _____

_____

Typical situations where Travel Charts could be used would be:

* studying the quantity of documents handled by a group of clerks in an office

* following the number of articles being made by each of the machines in a workshop.

The study tells us the volume of material, customers, passing between pairs of work stations and from that answer we can possibly decide after examination whether there is any back tracking or under- or over-loading of any work station.

Before starting the study it is necessary to identify the work stations, prepare a chart like the one below and decide on the period of time the study will last. Here is an example of a travel chart for a food store.

TRAVEL CHART

		TO								Total From Each Station To Other Stations
		A	B	C	D	E	F	G	H	
FROM	A									
	B									
	C									
	D									
	E									
	F									
	G									
	H									
Total to Each Station From Others In Systems										

WORK STATIONS - A = Entrance to Food store
B = Vegetables
C = Bread
D = Frozen Foods
E = Soft Drinks
F = Sweets
G = Tinned Food
H = CASH POINT

The customers entering the food store are observed and their movement from one work station to another is noted by placing a mark in the appropriate space.

ACTIVITY 41
Time guide
2 mins

Suppose you are recording the movement of customers in the food store. Place a cross in the appropriate box to show the movement of customers 2 and 3.

Customer 1 moves from entrance A to B then to C.
Customer 2 moves from entrance A to C then to B.
Customer 3 moves from entrance A to B then to E.

I've entered the information for customer 1 to get you started.

TRAVEL CHART

		TO								TOTALS
		A	B	C	D	E	F	G	H	
FROM	A		x							
	B			x						
	C									
	D									

Here's how I would record those three customers on the travel chart.

		TO								TOTALS
		A	B	C	D	E	F	G	H	
FROM	A		xx	x						3
	B			x		x				2
	C		x							1
	D									

You continue recording the movement of customers until the period of time has elapsed. If you lose sight of a customer it does not matter. All you need to do is to note as many separate customer journeys as you can conveniently do in the allotted time and so build up the general picture of movement in your shop.

ACTIVITY 42
Time guide
3 mins

Let us now look at a completed study carried out in the food store between 9.00 am and 12 noon.

TRAVEL CHART

		TO								TOTALS
		A	B	C	D	E	F	G	H	
FROM	A		80	30	5	2				117
	B			50	20	10	8	2	2	92
	C		10		20	2	30	20		82
	D			2		8	20	5	10	45
	E		2				3	5	12	22
	F					20		10	31	61
	G								4	4
	H									0
TOTALS			92	82	45	42	61	42	59	

Jot down the answers to the following questions. I've answered the first question to get you started.

1 How many customers have moved FROM

a) Vegetables (B) TO Bread (C)? 50 customers.

b) Frozen Foods (D) TO Sweets (F)? _____ customers.

c) Sweets (F) TO Soft Drinks (E)? _____ customers.

2 How many customers have entered the shop? _____ customers.

3 How many customers have backtracked? _____ customers.

The numbers of customers moving from vegetables (B) to bread (C) was 50, from frozen foods (D) to sweets was 20 and from sweets (F) to soft drinks was 20. In total 117 customers entered the shop and (10 + 2 + 2 + 20) 34 customers backtracked.

ACTIVITY 43
Time guide
4 mins

Look again at the completed travel chart we used in the last activity.

Suppose you are the store manager.

Jot down one thing for which you could use the information contained in the travel chart to help you understand more about what is happening in your store.

*

There are several things you could have mentioned. For instance:

* a comparison of the total number of customers passing to and from each work station will show where there are bottlenecks.

* a basis for comparing the balance of the workload for each work station is given by the total number of customers using them. This would help the manager re-think layout of the store and manning of work stations.

* showing up examples of work flow (numbers of customers dealt with in this case) which deviate from one expected path by by-passing certain stations or backtracking to others. To detect this you would, of course, have to know what was the flow you expected. This would help the manager re-think the layout of the store.

Now try the following self check before we move on.

SELF CHECK 15
Time guide
1 min

Jot down one example of what Travel Charts can be used to show.

*

The answer to this self check is here in the following words so you will have to check your answer carefully. Travel charts are able to show that work loads within a department may be out of balance or that the flow of work may not be following an assumed path or that bottlenecks are due to work piling up at the work station.

SELF CHECK 16
Time guide
5 mins

Let us recap on the type of information that you can record with the various techniques looked at so far. I have listed both the recording techniques A to F and the type of information that would be used to record 1 to 6. I would like you to match the recording techniques with the type of information by placing a tick in the appropriate space. I've completed the first one to get you started.

Recording Techniques	Used to Record						
	1	2	3	4	5	6	7
A Outline Process Chart	___	✓	___	___	___	___	___
B Travel Chart	___	___	___	___	___	___	___
C String Diagram	___	___	___	___	___	___	___
D Flow Process Diagram	___	___	___	___	___	___	___
E Two-handed Process Chart	___	___	___	___	___	___	___
F Flow Process Chart	___	___	___	___	___	___	___

Type of Information

1 Where the activity takes place.
2 Steps in the procedure or process only.
3 Paths of movement.
4 Movement of items between two work stations.
5 Total distances travelled.
6 Bottlenecks.
7 Inbalances of workloads between work stations.

The answer to this self check is here in the following words so you will have to check your answers carefully. Outline process charts, flow process charts and two-handed process charts are used to record the steps in the procedure or process only (2). String diagrams and flow process diagrams are used to record where the activity takes place (1), the paths of movements (3), the total distances travelled (5) and where bottlenecks take place (6). The flow diagram also shows the steps in the procedure and process (2). Travel charts are used to record paths of movement (3), movement of items between two work stations (4) and where bottlenecks take place (6).

SELF CHECK 17 Decide whether the following statements are TRUE or FALSE.
Time guide
3 mins

All the recording techniques looked at so far can be used to record

a) simultaneous activities of two or more workteam members or materials or items of plant.

TRUE/FALSE

b) more than one resource type on any single chart or diagram.

TRUE/FALSE

The answer to this self check is here in the following words, so you will need to check your answers carefully. My choice for statement a) was true and statement b) false. The recording techniques can be used to record simultaneous activites of two or more workers or materials or items of plant but only the activities of the particular resource to which it refers, either worker or material or plant, are recorded on any single chart.

4.3 Multiple Activity Charts

Sometimes you may find it useful to be able to record on one sheet the activities of various members of the workteam or pieces of equipment

IN RELATION TO EACH OTHER

A Multiple Activity chart allows you to do just this, plotting all the activities of the group against a common time scale.

Usually it's accurate enough just to time the activities of each member of the group with a clock or wristwatch because, for this chart, you are more interested in the relationship between what people are doing than the precise time taken.

In addition to recording the relationship between activities, a Multiple Activity Chart, when summarised, also gives you a clear picture of the time any one member of the group spends working or not working during the activity you're studying and the output per hour.

SELF CHECK 18 Jot down one main feature of a multiple activity chart.
Time guide
1 min

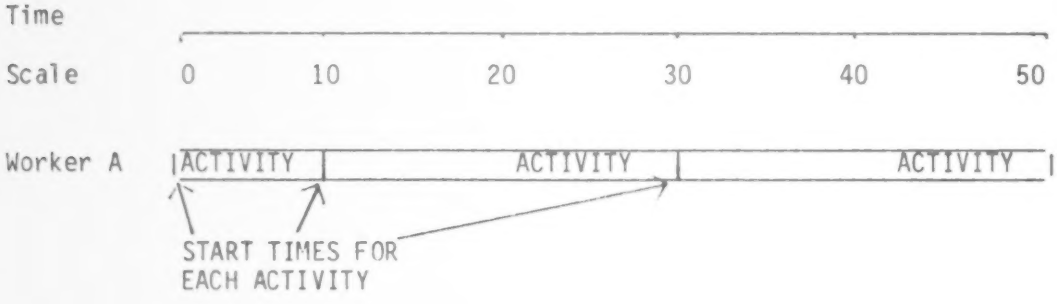
* _____

The main features of a Multiple Activity Chart are (1) they show the sequence of activities of each member of the group, on a single chart, together with the links of the activities to those of the other members of the team. (2) They record the work against a common time scale.

Let us think about the work of three fitters carrying out a limited car service on a while-you-wait basis. The observations and timings of the activities have been carried out and are shown below.

Start Times Hrs: Min: Secs	Code	Fitter No 1	Code	Fitter No 2	Code	Fitter No 3
8 00 00	A	Drives car on to ramp	W	Waits	W	Waits
02 00	B	Leaves car		"		"
02 30	W	Waits	C	Raises ramp		"
02 50	D	Removes sump nut	E	Greases underside	F	Checks tyres
03 00	G	Drains oil		"		"
03 20		" "		"	H	Tops up battery
03 50		" "		"	I	Greases upper points
04 00	J	Replaces sump nut	W	Waits		" " "
04 10	K	Refills with oil		"		" " "
05 00		" " "		"	W	Waits
05 10	W	Waits	L	Lowers ramp		"
05 30	M	Drives car off ramp	W	Waits		"
07 30	N	Leaves car		"		"
08 00	A	Drives next car onto ramp		"		"
10 00	B	↓ Activities repeated		↓ Activities repeated		↓ Activities repeated

The activities for each worker are now plotted in sequence on their own horizontal or vertical bar against a common time scale. A line is drawn across the bar to indicate the start time for each activity. For example



ACTIVITY 44
Time guide
5 mins

Now let us look at the recording for Fitter No. 1 on his own. The time scale and bar representing Fitter No. 1 are shown below. I've entered the first few activities. You complete the remaining activities by entering the appropriate code number from the chart on page 79.

Time Scale

8.00 8.01 8.02 8.03 8.04 8.05 8.06 8.07 8.08 8.09 8.10 8.11 8.12

Fitter No 1

A	B	W	D	G	J	K	

I would complete the bar for Fitter No. 1 like this which you might like to compare with your own version.

Time Scale

8.00 .01 .02 .03 .04 .05 .06 .07 .08 .09 .10 .11 .12

Fitter No 1

A	B	W	D	G	J	K	W	M	N	A	

ACTIVITY 45
Time guide
5 mins

Complete the multiple activity chart shown below for the three fitters offering a limited car service. I've entered the activities for Fitter No. 1 to get you started.

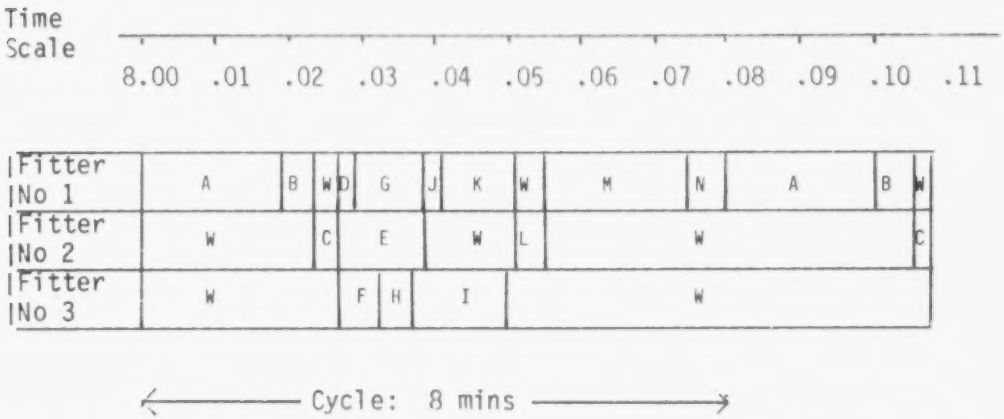
Time Scale

8.00 .01 .02 .03 .04 .05 .06 .07 .08 .09 .10 .11

Fitter No 1	A	B	W	D	G	J	K	W	M	N	A		
Fitter No 2													
Fitter No 3													

7.3

The completed Multiple Activity Chart is shown below, check your response carefully.



The work cycle for this job is 8 minutes. In other words, the car servicing is repeated every 8 minutes providing another car is waiting.

Before we can really use the information the Multiple Activity Chart contains we have to summarise the contents. We do this by working out:

a) the use being made of the people, equipment or materials studied

b) the output per hour.

a) Utilization of the resources

Working out the use being made or the utilization of the resources involves calculating the percentage of time working and not working for each resource. For example the Utilization of Fitter No. 1 is calculated as follows.

$$\% \text{ of time spent working} = \frac{\text{Time spent working}}{\text{Work Cycle}} \times 100\%$$

$$= \frac{440 \text{ secs}}{8 \times 60 \text{ secs}} \times 100 = 91.7\%$$

Therefore the % of time spent waiting

$$= 100\% - 91.7\% = 8.3\%$$

ACTIVITY 46
Time guide
6 mins

Calculate the utilization for both Fitters No 2 and 3 by filling in the blanks. You might find it useful to use a calculator if you don't feel like working this out in your head.

Fitter No. 2

% of time spent working = $\frac{\text{_____ secs}}{\text{secs}} \times 100 = \text{____ \%}$

Therefore % of time spent waiting = 100% - _____ % = _____ %

Fitter No. 3

% of time spent working = $\frac{\text{_____ secs}}{\text{secs}} \times 100\% = \text{_____ \%}$

Therefore % of time spent waiting = 100% - _____ = _____ %

Here is my summary of the utilization of fitters No 2 and 3.

Fitter No. 2

% of time spent working = $\frac{110}{480} \times 100 = 22.92\%$

Therefore % of time spent waiting = 100% - 22.92% 77.08%

Fitter No. 3

% of time spent working = $\frac{130}{480} \times 100 = 27.08\%$

Therefore % of time spent waiting = 100% - 27.08% = 72.92%

Summary — Utilization

	% of time working	% of time waiting
Fitter No. 1	91.6	8.3
Fitter No. 2	22.92	77.08
Fitter No. 3	27.08	72.92

b) Output per hour

The output per hour is calculated by dividing the workcycle time into one hour and multiplying by the output completed during the workcycle. In this example, the workcycle = 8 min and the output during the workcycle = 1 car.

Output per hour = $\frac{1 \text{ hour}}{8 \text{ min}} \times 1 \text{ car} = \frac{1 \times 60 \text{ min}}{8 \text{ min}} \times 1 \text{ car} = 7.5 \text{ cars/hr}$

SELF CHECK 19 Decide whether each of the following statements is TRUE or FALSE.
Time guide
4 mins

a) In recording the facts on a multiple activity chart the accuracy of the timing of the activities is more important than the relationship between the activities.

TRUE/FALSE

b) Multiple activity charts are used to record the sequence of activities only against a common time scale.

TRUE/FALSE

Complete the following statements with a suitable word or group of words.

c) Multiple activity charts are used to record on a single chart against a common _____ _____, the activities of a resource in relation to one or _____ other _____.

d) The summary of the information recorded on a multiple activity chart shows percentage of time _____, the percentage of time _____ _____ and the _____ per _____ per hour.

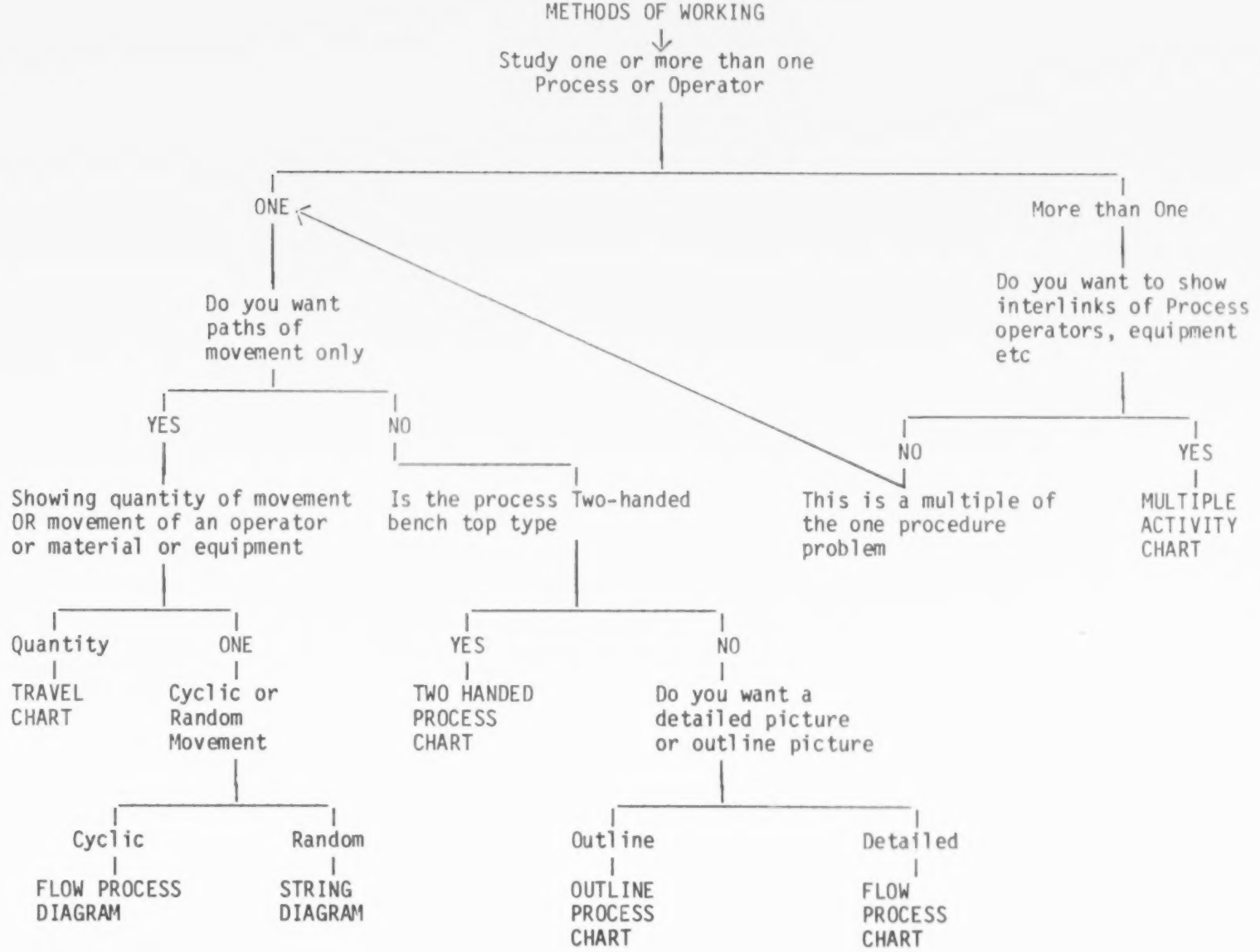
The answers to this self check are here in the following words so you will have to check your answer carefully. My answer to both a) and b) would be false. The relationship between the activities is more important that the accuracy of the timing and multiple activity charts not only record the sequence of activities against a common time scale but also the relationship between activities. c) Multiple activity charts are used to record on a single chart against a common time scale, the activities of a resource in relation to one or more other resources. d) The summary of the information recorded on a multiple activity chart shows percentage of time working, the percentage of time not working and the output per man per hour.

Multiple Activity Charts have many important uses, attempting further examples will help you understand them better.

4.4 Quick check on charts

In this part of the unit we've covered a number of recording techniques. If you're thinking of using them and are not quite certain which one to use you may find the following chart gives you a useful quick check.

CHOOSING THE RECORDING TECHNIQUE



5 Summary

Work is selected for a method study investigation taking into account the:

economic considerations
technical considerations
human considerations

Recording Technique symbols are:

operation

inspection

storage

transport

delay

operation and inspection.

Process charts

Used for recording the sequence of activities only.

Types of Chart

Outline process charts
Flow process charts
Two-handed process charts.

Diagrams

Used to record

the sequence of activities
paths of movement
distances travelled
where the activity takes place

Types of Diagram

Flow Process Diagram
String Diagram
Travel Charts
Multiple Activity Charts

Used to record

- the sequence of activities
- relationship between the activities of different resources
- the time taken by each activity.

PART C - EXAMINE, DEVELOP, INSTALL AND MAINTAIN

1 Introduction

In Part B we looked in some depth at the first two stages of a six stage plan for carrying out a method study - select the problems and record the relevant facts. Now we're in a position to examine the information we've assembled.

The ability to analyse a situation at work and produce an acceptable improvement which becomes standard practice is a very useful skill, whatever job you are doing. Method study gives us the disciplined framework within which to carry out this analysis.

So let's move on to the rest of our six stage plan and see how we can examine the facts critically, recommend and develop an improved method, install that method as standard practice and maintain it by routine checks.

EXTENSIONS 1 and 2 page 104

Obviously we can only go so far in this unit. If you feel you want a more specialised understanding of the subject you might like to take up these extensions.

2 Examine

When you examine facts you are only interested in what is actually happening.

Nevertheless, you're going to be bombarded with people's opinions and prejudices (not to mention your own) during your study and it helps to keep to the facts as they are if your examination follows a set plan. So let's begin by looking at a systematic examination procedure.

2.1 Examination Procedure

You begin by focusing your attention in turn on each individual activity, starting with the activities you consider to be the most important to the overall process. But how do you decide which are the most important?

ACTIVITY 47
Time guide
2 mins

Operations may be classified as

'make ready' operations
'do' operations and
'put away' operations.

Match each one to the following description by writing either 'make ready' or 'do' or 'put away' in the space at the start of the description.

a) _____ operations represent the actual performance of work on the material or work with plant and equipment and they result in a change.

b) _____ operations are concerned with the preparation of material, plant or equipment.

c) _____ operations are concerned with the clearing up.

I hope we can agree that the answer to a) is 'do' b) is 'make ready' and c) is 'put away'.

ACTIVITY 48
Time guide
2 mins

I think 'do' operations are the most important and should be examined first. Jot down one reason why you think this might be so.

*

Perhaps you've said something along the lines of the fact that all 'make ready' and 'put away' operations are dependent on there being a 'do' operation in the first place. If we can eliminate a certain 'do' operation then the related 'make ready' and 'put away' operations, as well as corresponding transports and delays, will automatically disappear.

Then, having selected our most important activity, we use a well-designed questioning technique to determine the need for and usefulness of that particular activity in the workplace.

The questioning technique helps you to establish:

the facts as they are
the underlying reasons
the alternatives
the means of improvement - leading to the recommended method

In each case you will question

- the purpose
- the place
- the sequence
- the person
- the means

Establishing the present facts

Let's think about each of these in turn, starting with determining the facts as they are.

ACTIVITY 49
Time guide
2 mins

Against each of the headings Purpose, Place, Sequence, Person and Means, complete the questions you would ask to determine the facts as they are. I've completed the first question to get you started.

1 Purpose _____WHAT is the purpose of the activity?

2 Place _____ is the activity done?

3 Sequence _____ is the activity done?

4 Person _____ does the activity?

5 Means _____ is the activity done?

To determine the purpose of the activity you would ask, what is the purpose of the activity? To determine the place you would ask, where is the activity done? To determine the sequence you would ask, when is the activity done? To determine the person involved you would ask, who does the activity? And finally to determine the means, you would ask how is the activity done?

To illustrate the questioning technique for determining the facts as they are let's think about the work of two bricklayer's labourers employed to load a scaffold with bricks. The sequence of activities, the time taken and the Multiple Activity Chart are shown below.

Jones - Labourer 1		Time Mins - Secs
A	Loads 48 bricks to barrow	1 - 50
B	Wheels barrow to hoist and	0 - 25
	Waits for hoist to be lowered	2 - 45
C	Opens hoist gate and removes empty barrow	0 - 25
D	Wheels full barrow into hoist	0 - 30
E	Wheels empty barrow to stock	0 - 20

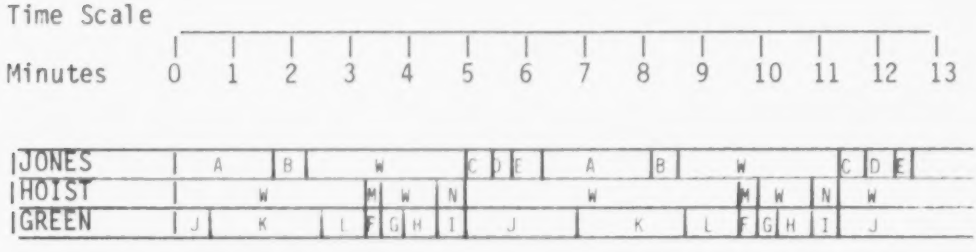
Repeats Activities A - E until all bricks are moved

Green - Labourer 2		
F	Raises hoist	0 - 20
G	Opens hoist gates and removes full barrow	0 - 25
H	Wheels empty barrow into hoist and closes hoist gate	0 - 30
I	Lowers hoist	0 - 20
J	Wheels full barrow to stack on scaffold	2 - 00
K	Unloads bricks to stock	1 - 50
L	Wheels empty barrow back to hoist	0 - 50

Repeats activities F - L until all bricks are moved.

HOIST		
M	Hoist Raised	0 - 20
N	Hoist Lowered	0 - 20

MULTIPLE ACTIVITY CHART



WORK CYCLE - 6 min 15 sec

ACTIVITY 50
Time guide
5 mins

In the space provided below jot down the facts regarding the activity 'F' raise hoist. I've completed the first question to get you started.

Activity Examined	Raises Hoist
What is the purpose of the activity?	To raise bricks vertically from the ground to scaffold level.
Where is the activity done?	Information not available
When is the activity done?	
Who does the activity?	
How is the activity done?	

I hope we can agree that the purpose of the activity is to raise bricks vertically from the ground to scaffold level. It is not known where the activity takes place but this is not important in this instance. The activity is carried out after activity 'D' wheels full barrow into hoist and closes gate and the hoist is raised by labourer Green.

It is important that we don't confuse purpose with means. The purpose is to raise the bricks vertically not to raise the hoist, this is the means by which the bricks are raised vertically.

Now let's consider the reasons underlying the facts.

ACTIVITY 51
Time guide
1 min

Against each of the headings, complete the questions you would ask to determine the reasons underlying the facts. I've completed the first question to get you started.

Activity Examined - Raises hoist

1 Purpose	WHY	is it necessary to achieve this purpose?
2 Place		there?
3 Sequence		then?
4 Person		that person?
5 Means		that ?

In each case you would ask the question why. Why is it necessary to achieve this purpose? Why there? Why then? Why that person? and why that way?

Clearly in real life you would have to know more about the work carried out by our two bricklayer's labourers but, for now, we'll assume that we can get as much information as we need from what we already know about this situation.

ACTIVITY 52
Time guide
2 mins

Let's just think for a moment about the question:

WHY that person?

Jot down one reason why you think that Green, who is the labourer working up on the scaffold in our example, operates the hoist.

I've thought of one possibility to get you started.

* The controls to operate the hoist are at scaffold level.
* _____

_____

Perhaps your suggestion is among these, though it's equally possible that you thought of something else altogether.

* Jones did not like operating the hoist
* Jones was not capable of operating the hoist
* Green always took charge and felt he was in control if he operated the hoist
* It just happened this way

Whatever the reason it is important you record the reason accurately after consultation with those concerned and thus you can build up a full picture of what happens and why.

Our questions so far have enabled us to determine:

the facts as they are

the underlying reasons

(although in real life we must accept that we would have to ask many more questions than we've shown in our example).

These two sets of questions are known as

PRIMARY QUESTIONS

When you are satisfied with the answers to the primary question you are ready to consider the alternatives.

Developing Possible Alternatives

ACTIVITY 53
Time guide
2 mins

Complete the list of headings and then alongside each heading complete the questions you would ask to determine the alternatives. I've completed the first question to get you started.

ACTIVITY EXAMINED - RAISES HOIST

1	Purpose	WHAT	ELSE	could be done?
2	_____	_____	_____	could it be done?
3	Sequence	_____	_____	could it be done?
4	_____	_____	_____	could do it?
5	Means	_____	_____	could it be done?

In determining the alternatives you would need to ask the following questions; what else could be done? (purpose) where else could it be done? (place) when else could it be done? (sequence) who else could do it? (person) and how else could it be done? (means).

ACTIVITY 54
Time guide
2 mins

As previously, let's just consider the question referring to the person as an example. Remember Green raises the hoist at present. Jot down in the space below an alternative to the question.

WHO ELSE COULD RAISE THE HOIST

* _____

Your response to this question will depend a great deal on the answer to the question 'why does this person do it?' However the answer will be one of the following

* Jones could raise the hoist

* Someone else could be brought in to the team to raise the hoist

* There is no alternative to Green raising the hoist.

I hope we can agree that this covers all the alternatives.

Selecting The Practical Alternative

When you have applied each of the questions to the purpose, place, sequence, person and means, a number of alternatives may have been suggested. You are now ready to suggest the means of improvement and consequently the recommended method.

ACTIVITY 55
Time guide
2 mins

Alongside each of the headings, jot down the questions you would need to ask to establish the means of improvement and consequently the recommended method. I've entered the first question to get you started.

1 Purpose - What should be done?

2 Place - _____

3 Sequence - _____

4 Person - _____

5 Means - _____

The answer to this activity follows so check your response carefully.

The questions you would ask to establish the means of improvement and consequently the recommended method are:

* What should be done?

* Where should it be done?

* When should it be done?

* Who should do it?

* How should he do it?

These are known as

SECONDARY QUESTIONS

ACTIVITY 56
Time guide
4 mins

Think about the activity RAISE HOIST and jot down who you think should do it. Green, Jones or someone else and the reason for your answer. To help you make your decision here is the summary from the Multiple Activity chart used to record the present method.

Summary

Utilisation

	% of time spent working	% of time spent not working
Jones	56	44
Green	100	0
Hoist	10.67	89.34

Work cycle: 6 mins 15 sec

Output/man/hour = 230.4 bricks/man hour

Who should raise the hoist?

* _____

* Why _____

_____

I would suggest Jones raises the hoist, for the following reasons:

- Jones spends 44% of his time not working. This suggests he has time to do this operation and there is no need to employ anyone else.
- Green works 100% of the time. By arranging for Jones to raise the hoist would reduce his workload and the workcycle from 6 mins 15 sec to 5 mins 55 sec.
- The reduced workcycle would in turn increase the output per man hour.

ACTIVITY 57
Time guide
5 mins

Assuming Jones now raises the hoist calculate the output per man hour. Remember 48 bricks are moved every 5 min 55 secs.

Output per man hour = $\frac{1 \text{ hour}}{\text{workcycle}}$ x $\frac{\text{no of bricks moved/work cycle}}{\text{no of men}}$

Output per man hour = _____ x _____

Output per man hour = _____ bricks

Here is my response to that activity for you to compare with your own.

Output per man hour = $\frac{3600 \text{ sec}}{355 \text{ sec}}$ x $\frac{48}{2}$ = 243.4 bricks

This is an increase of 243.4 - 230.4 bricks

= 13 bricks/man hour

This improvement has been achieved by simply changing the person doing the activity.

ACTIVITY 58
Time guide
3 mins

Changing the person doing the activity is one way of bringing about an improvement. Jot down two ways in which you think improvements could be brought about.

* _____

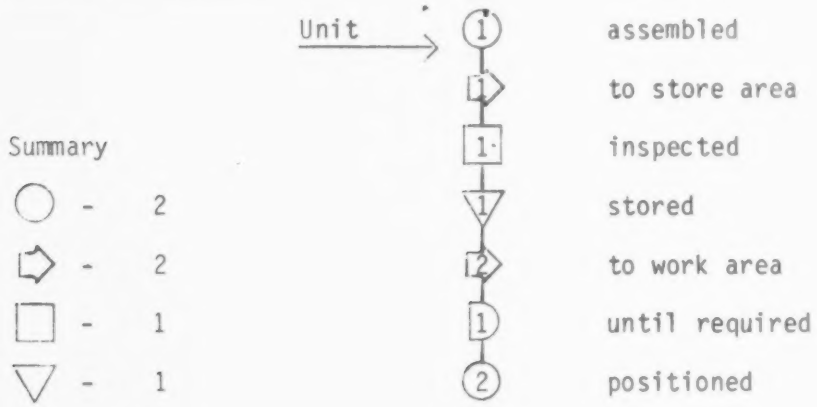
* _____

Improvements to the present method could be brought about by

* eliminating an activity
* modifying an activity by changing it or combining it with other activities
* changing the place where the work is done
* changing or re-arranging the sequence in which activities are done
* simplifying the means of doing the job

To illustrate further how improvements can be brought about here is an example of how changing the place where the work is done can improve the method. The following information was recorded using a flow process chart and flow process diagram.

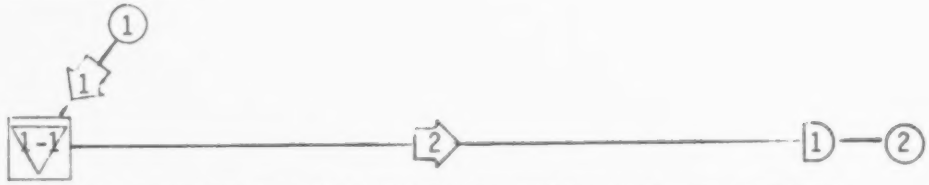
Flow Process Chart



Summary

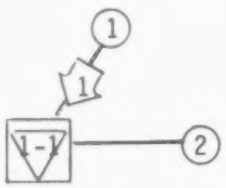
○	-	2
⇨	-	2
□	-	1
▽	-	1
D	-	1
Total		7

Flow Process Digram



After critical examination the following method was put forward

Flow Process Diagram of New Method



ACTIVITY 59
Time guide
3 mins

Jot down two differences between the two methods. I've entered one difference to get you started. You enter a further two.

* The place where (1) is done has changed. It is now closer to work area
* _____
* _____

The main differences in the two methods are

* the place where (1) is done has changed

* activities [2] and [1] have been eliminated

* double handling has been eliminated.

Critical Examination Sheet

You have worked through the examination procedure, using the questioning technique to enable you to determine

a) the facts as they are
b) the reasons underlying the facts
c) the alternatives
d) the means of improvement and consequently the recommended method.

To ensure that you carry out the critical examination in a methodical way and are not tempted to rely on opinion rather than true facts, I suggest you use a Critical Examination Sheet. The sheet has the questions laid out in sequence, with space for suitable comment.

ACTIVITY 60
Time guide
7 mins

Here is an example of the layout of an examination sheet. Jot down in the spaces provided the questions you should ask. I've entered some of the questions and headings to get you started.

CRITICAL EXAMINATION SHEET

Activity Examined - RAISE HOIST

	Primary Questions		Secondary Questions	
	Present Facts	Reasons	Alternatives	Selected Method
Purpose				
		Why There?		
				When should it be done?
			Who else should do it?	
	How is it done?			

Remember jot down the questions only.

Here is a completed Critical Examination Sheet for you to compare with your own.

CRITICAL EXAMINATION SHEET

Activity Examined - RAISE HOIST

	Primary Questions		Secondary Questions	
	Present Facts	Reasons	Alternatives	Selected Method
Purpose	What is the purpose?	Why it is done?	What else could be done?	What should be done?
Place	Where is it done?	Why there?	Where else could it be done?	Where should it be done?
Sequence	When is it done?	Why then?	When else could it be done?	When should it be done?
Person	Who does it?	Why that person?	Who else could do it?	Who should do it?
Means	How is it done?	Why that way?	How else could it be done?	How should it be done?

As a busy supervisor you should always be on your guard against the belief that a valid reason for continuation of any activity is that it has always been done that way. You should occasionally stand back and apply the questioning sequence to the activities for which you are responsible.

SELF CHECK 20
Time guide
5 mins

Complete the following statements by filling in the missing words or groups of words.

a) The elimination of a _____ operation will enable _____ _____ operations and _____ _____ operations connected with them automatically to be _____ as well as corresponding _____ and delays.

b) Primary Questions are used to determine the facts as _____ _____ and the _____ _____ the facts.

c) Secondary Questions are used to determine the _____ and the _____ of improvement and consequently the _____ _____

Answer TRUE or FALSE in the space provided to the following questions.

d) The questions What is done? Why is it done? What else could be done? and What should be done? determine the MEANS.
TRUE/FALSE

e) The questions How is it done? Why is it done that way? How else could it be done? How should it be done? determine the SEQUENCE.
TRUE/FALSE

f) The questions Where is it done? Why is it done there? Where else could it be done? Where should it be done? determine the PLACE.
TRUE/FALSE

g) The questions When is it done? Why is it done there? When else could it be done? When should it be done? determine the PURPOSE.
TRUE/FALSE

h) The questions Who does it? Why does that person do it? Who else could do it? Who should do it? determine the PERSON.
TRUE/FALSE

The answers to this self check are here in the following words so you will have to check your answers carefully. a) The elimination of a 'do' operation will enable 'make ready' operations and 'put away' operations connected with them automatically to be eliminated as well as corresponding transports and delays. b) Primary Questions are used to determine the facts as they are and the reasons underlying the facts. c) Secondary Questions are used to determine the alternatives and the means of improvement and consequently the recommended method. The answer to d) is false, these questions will determine the purpose not the means; the answer to e) is false, these questions will determine the means not the sequence; f) is true; g) is false, these questions will determine the sequence and not the purpose; and the answer to h) is true.

3 Develop

The critical examination is applied to the recorded facts at both the 'examine' and 'develop' stages of a six stage method study plan. The primary questions are the examination stage and the secondary questions the start of the developmental stage which will result in a new method being selected from a number of alternatives.

Many method study solutions do not result in a major upheaval of machinery or re-deployment of the workteam and can therefore be put into use within a few days of the study.

SELF CHECK 21
Time guide
3 mins

Let's just recap on the way improvements to the present method may be brought about. Jot down two ways, I've given you one to get you started.

* eliminating an activity
* _____
* _____

The answer to this self check is here in the following words so you will have to check your answer carefully. Improvement to the present method could be brought about by * eliminating an activity * modifying an activity by changing it or combining it with other activities * changing the place where the work is done * changing the sequence in which activities are done * simplifying the means of doing the job.

As a supervisor you will possibly be allowed to introduce certain changes to existing procedures without needing to report to management.

ACTIVITY 61
Time guide
5 mins

Jot down two types of changes that you as a supervisor could possibly implement without first reporting to management. I've entered a suggestion to get you started.

* changing the position of tools
* _____
* _____

There are a number of changes you could suggest - your response may have included some of the following.

* Changes in the sequence of operations.
* Storing the necessary materials in a systematic fashion.
* Clearing out unnecessary materials.
* Minor changes to the department layout.
* Minor changes to materials handling.
* Introducing the use of jigs, templets etc.

These changes could result in substantial improvement in productivity. Before making the changes part of standard practice it may be necessary to check that the new method is the best solution you can think of and that it will withstand any further analysis that may be made.

ACTIVITY 62
Time guide
2 mins

Jot down what you consider would be the procedure for doing this. I'll give you a clue. Think of how this is done with the existing method.

* _____

_____

You would check that the new method is the best solution by recording the new facts, using an appropriate recording technique and then critically examining the activities until you are satisfied that the new method is the best solution.

Other improvements that will require more effort and capital to implement will need the permission of management before you would be allowed to make the necessary changes.

ACTIVITY 63
Time guide
4 mins

Jot down two types of changes that would need the permission of management before you would be able to make the changes. I've entered one suggestion to get you started.

* changes in the position of machines
* _____
* _____

There are again a number of changes you could suggest and your response will depend on where you work. Your response however may have included some of the following.

MATERIALS

* Changes in specification, size, form, finish.

DESIGN

* changes in the shape, tolerances, appearance of a product.

WORK FLOW

* major changes in the sequence of operations, work places, department layout, materials handling.

WORK PLACE

* major changes in positioning of work and equipment.

Your proposals for a new method should be presented to management in report form and your ideas should be tried out first if possible.

ACTIVITY 64
Time guide
3 mins

Let us look first at the presentation of your ideas in written report form. Jot down two things you feel should be included in the report. I've entered one suggestion to get you started.

* clear statement of the benefits
* _____
* _____

There are a number of things you'd need to include in a written report. Your response may have included some of the following

Form of Work Study Report submitting Proposals to Management.

* Introduction.
* Summary.
* The existing situation.
* The work study approach used.
* Alternative solutions.
* Recommendations.
* Implications of recommendations.
* Benefits.

EXTENSION 3 page 104

If you would like to know more about presenting your ideas clearly to management you might like to read another unit in this series, Writing Skills.

4 Install

EXTENSION 1 page 104

Having carried out the first four stages in the method study and having convinced management of the benefits of the new method you are now ready for the improved method to be installed as standard practice. If you have consulted people at each stage of the study then installation will be made easier. It can however only be emphasised that all concerned with the investigation are kept informed throughout each stage of the installation.

At the beginning of this stage the new method will have been agreed by all concerned to be suitable, but the detailed actions necessary to change from the existing method to the new one will have to be worked out.

ACTIVITY 65
Time guide 2 mins

Suppose you have to help install a new method involving major changes. Jot down two examples of the decision that will need to be made before installation can take place. I've entered one such decision to get you started.

* order new plant or materials
* _____
* _____

The decisions that may have to be taken will include

* ordering new plant or materials

* phasing in changes of production rates

* deciding how much redeployment will be necessary, when it will take place and which individuals will be involved

* who needs retraining

* who will do the retraining

* how long will it take

* when to introduce new documentation procedures

* setting new quality standard and test procedures.

A detailed timetable may be necessary for a complicated project with many changes.

The installation stage will be complete when the new method is in operation at the work site and the target levels set are under the complete control of the supervisors.

5 **Maintain**

This is the last stage of the method study investigation. Once you have the new method installed suitable controls should be introduced to ensure that the improvements are maintained. At the same time ensure that the necessary paperwork highlights variations in operating costs and does not restrict further improvement in any way. Periodic inspection should be carried out to check the validity of the methods and controls and any defaults reported as soon as possible.

ACTIVITY 66
Time guide
2 mins

Suppose you are responsible for maintaining a new method. Jot down one thing you feel you'd need to do to ensure that any benefits from the new method are maintained. I've entered one suggestion to get you started.

* check on costs/unit

* _____

Your response to this activity may have included one of the following.

Carry out routine checks on the method

Keep a check on: the output
bonus payments
materials
workers
equipment
location
layout etc.

EXTENSION 4
page 104

If you would like to know more about the ways of controlling output you might like to read another unit in this series - Controlling Output.

If a work study officer has carried out the study then it will be his responsibility to see that the job is installed and maintained in accordance with the new job method. It will however still be your job as a supervisor to give instructions about the changeover with the work study officer taking an advisory role.

SELF CHECK 22
Time guide
3 mins

Divide whether the following statements are TRUE or FALSE.

a The primary questions are the start of the development stage

TRUE/FALSE

b Consultation with all concerned is vital to successful installation of a new method.

TRUE/FALSE

c The last stage in the method study is install.

TRUE/FALSE

Complete this statement with suitable words or groups of words.

d To ensure that the improvements are _____, suitable _____ should be introduced.

The answer to this self check is here in the following words so you will have to check your answer carefully. a The secondary questions start the development stage so this statement is false. b It is vital that consultation with all concerned takes place to ensure successful installation of a new method. c The last stage in method study is not install but maintain so this statement is false. d To ensure that the improvements are maintained, suitable controls should be introduced.

6 Summary

Examination Procedure

Purpose:	What is done? Why is it done? What else could be done? What should be done? Objective: - Eliminate
Place:	Where is it done? Why is it done there? Where else could it be done? Where should it be done? Objective: Change or Combine
Sequence:	When is it done? Why is it done then? When else could it be done? When should it be done? Objective: Change or Combine
Person:	Who does it? Why does that person do it? Who else could do it? Who should do it? Objective: Change or Combine
Means:	How is it done? Why is it done that way? How else could it be done? How should it be done? Objective: Simplify

Changes in the method used could improve the

- design and specification
- method of operation
- planning and supervision of the work resulting in

INCREASED PRODUCTIVITY.

Development - involves trying out the new ideas and submitting the proposals to management.

Installation - working out a detailed programme for when and how the changes will be brought about. Remember it's important to have the workteam on your side throughout.

Maintenance - keep up checks to ensure the improvements you worked for are maintained.

PART D - PERFORMANCE CHECK

Time guide
60 mins

1 End Check

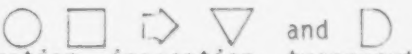
You may review your understanding of the unit as a whole by completing this group of questions. DON'T GUESS THE ANSWERS - if you're not sure, flick back into the unit and check before responding.

If you're still unsure put a question mark against your response before proceeding.

TRUE/FALSE

Respond to each statement by writing either true or false in the space provided.

1 Method study is the systematic recording and critical examination of the ways of doing things in order to make improvements. _____

2 The symbols  denote operation, inspection, transport, storage and delay respectively. _____

3 A chart on which the activities of more than one subject (workteam member, equipment or material) are each recorded against a common time scale to show their interrelationship is called a Multiple Activity Chart. _____

4 Productivity is the unit of input per unit of output. _____

5 If your workteam provides a service, method study will not help you in your role as a supervisor. _____

6 As a supervisor you are in charge of your work area, method study is a tool to help you and the work study specialist operates in an advisory capacity only. _____

7 The secondary questions are used to detemine the facts as they are and the reasons underlying the facts. _____

8 Method study can help to generate an awareness of the need for everyone in the workplace to be concerned about the way things are done. _____

COMPLETION

Respond by completing each sentence with a suitable word or words.

9 The reasons for selecting work for a method study may be sub-divided into technical considerations, _____ considerations and _____ considerations.

10 The degree of accuracy achieved in _____ what is taking place on the job determines the success of the whole method study procedure.

11 Method study shows where change is likely to be most effective by highlighting unnecessary _____ and showing where _____ are possible.

12 _____ operations represent the actual performance of work and they result in a _____ taking place.

13 Keeping doors in a hut is storage, carrying doors to the place where they are to be fixed is _____, stacking the doors until they are needed is a _____, fitting the doors is an operation, and testing that the doors work correctly is an _____.

14 Improvements to the existing method may be brought about by eliminating a _____, changing the _____ where the work is done or the _____ in which activities are done.

15 _____ with all concerned is vital to successful installation of a new method.

16 To ensure that improvements are maintained suitable _____ should be introduced.

MULTIPLE CHOICE

Respond to each question by putting a tick against the ONE answer which is most correct.

17 Which of the following charts is part of an outline process chart.

a)

b)

c)

d)

18 Which of the following charts is not part of a two handed-process chart?

a)

b)

c)

d)

19 Which of the following charts represents the following activities?

materials delivered by road
unload materials
check for quality and quantity
store material
move material to work area
materials wait for workmen
materials fixed into position

a)

b)

c)

d)

20 Which of the following represents the six basic steps of method study?

a)	b)	c)	d)
Select	Select	Select	Select
Examine	Record	Record	Record
Record	Develop	Examine	Examine
Develop	Examine	Develop	Develop
Install	Install	Maintain	Install
Maintain	Maintain	Install	Maintain

21 Which of the following statements is correct?

a) Record and examine the facts as they should be

b) Record and examine the facts as somebody says they are

c) Record and examine the facts as they might be

d) Record and examine the facts as they are

22 Which of the following headings do these questions examine?

What is done?

Why is it done?

What else could be done?

What should be done?

a) Place

b) Purpose

c) Sequence

d) Person

e) Means

23 Process charts are used to record

a) the steps in the procedure on production process only

b) the paths of movement only

c) interlinks of the process only

d) an outline picture of the process only

24 Travel charts are used to record

a) cyclic movement of many items

b) random movement of one item

c) cyclic movement of one item

d) random movement of many items

END CHECK - Checkout

Audio Tape
Side 2
Time guide
35 ■ins

The answers and explanations for these End Checks are on Side 2 of our Audio Tape. Have your responses with you as you play this tape. As you listen you can check out how well you have done and make notes as you proceed.

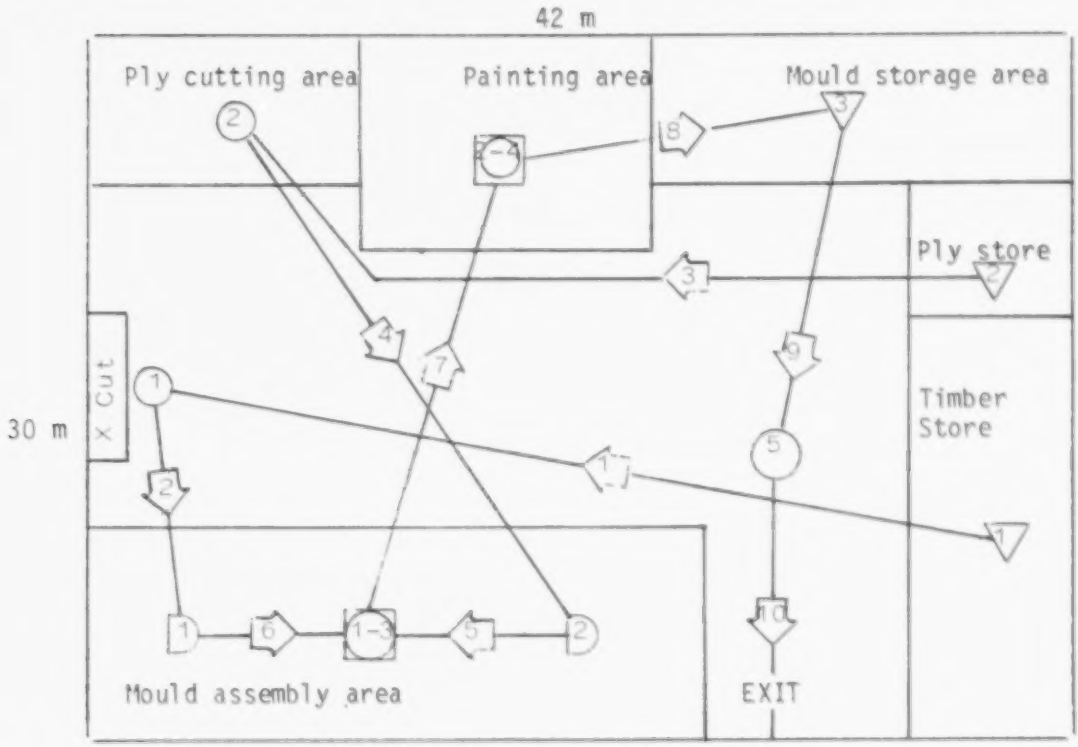
2 Tutor Check

Time guide
60 mins

Suppose you are the supervisor in charge of the manufacture of the plywood and timber moulds. Critically examine and develop an improved method. Prepare a flow process diagram of the new method and summarise the benefits.

The existing method is shown below. You can change the position of the work area within the compound and the exit/entrance, but their size and shape must remain the same.

Flow Process Digram - Existing Method



MOULD MANUFACTURING COMPOUND Scale 1 cm = 3 m

Try using card templets to record alternative layouts.

Flow Process Chart

Process: Manufacture of plywood and timber moulds

Chart begins: plywood and timber in store

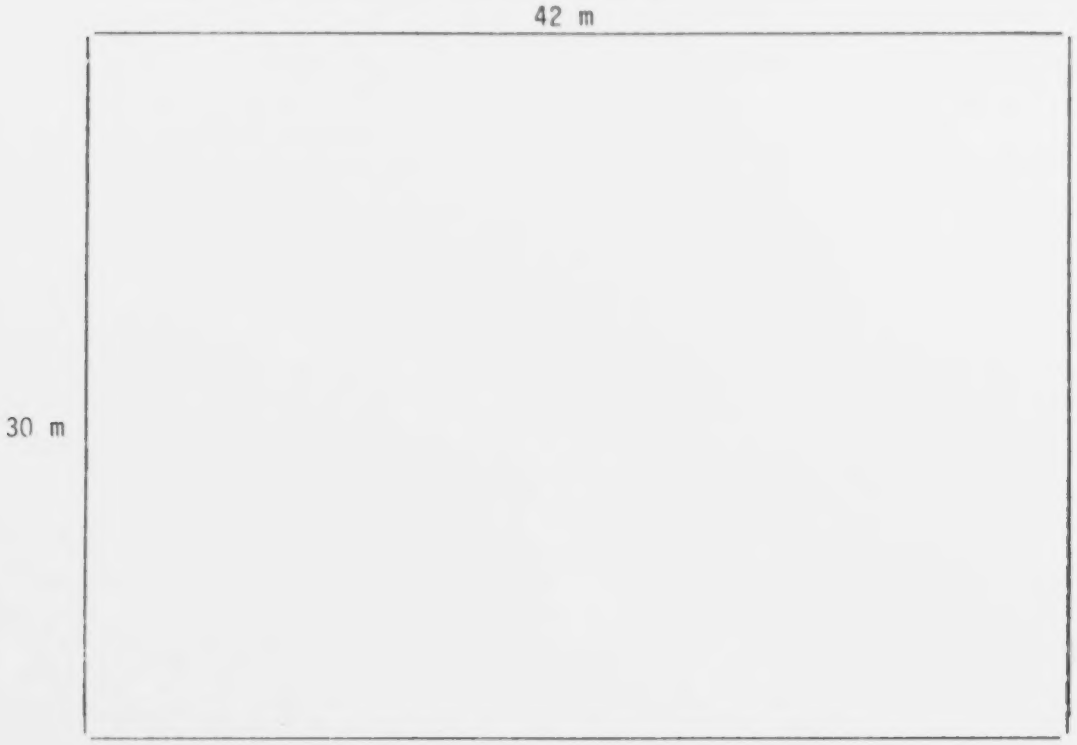
Chart ends: moulds to building site

Chart type: material

Summary

○	- 5
⇨	- 10
▽	- 3
□	- 2
D	- 2
Total	22

Mould Manufacturing Area - Proposed Method



MOULD MANUFACTURING COMPOUND Scale 1 cm = 3 m

Summary - Distances Travelled

Timber

Plywood

Moulds

Total _____

Activities

○ -

⇨ -

▽ -

□ -

D -

Total _____

101

3 Work Based Project

Time guide 60 mins

Carrying out a method study in your workplace would take much longer than an hour. However, for this work based project, you will be carrying out some of the activities which would be involved in a full-scale method study, so you had better have a word with your manager before you start to make sure you have approval for what you plan to do.

1 Choose an operation or area of work for which you are responsible or with which you are familiar and, in a sentence or two, say what its purpose is. (Don't choose anything too ambitious or this could take you far longer than the time suggested.)

2 Discuss the operation or area of work with any members of the workteam who are involved with the work in question and willing to talk to you about it.

On the basis of that discussion, list what you think the problems are.

(If it isn't possible to chat to others about this, identify the problems as you see them.)

3 Record all the relevant facts using any of the recording techniques we have looked at.

4 Choose an activity that appears to give the greatest scope for improvement and critically examine it.

Send to tutor

Now get your answers to your study tutor either by post or handing it over personally. You will receive your tutor's assessment and comment back through the post as soon as can be managed.

This is all you need do to complete the work-based poject. However, if you would like to take your method study of the area you've selected further, then you would need to continue with the critical examination, develop an improved method and, finally, prepare a report on the results of your study.

PART E UNIT REVIEW

1 Return to Objectives

Having completed your work on this unit let's review how you feel about each of the four opening objectives. I'll repeat them here and add a comment to each.

You should now be better able to

* UNDERSTAND WHAT METHOD STUDY CAN ACHIEVE

Method study is a means of achieving higher productivity by improving the way you do things. If you understand this statement and can think of some of the ways this can be brought about then you have met this objective.

You will be better able to

* EVALUATE THE BENEFITS OF USING METHOD STUDY

I hope what we have discussed in this unit has helped you to decide whether or not method study is a waste of time. In the beginning method study isn't easy but I hope you can see the possibilities for it in your workplace and that being involved in method study will be useful to the development of your career.

You will be better able to

* USE THE BASIC TECHNIQUES OF METHOD STUDY FOR INVESTIGATING AND SOLVING PROBLEMS

In this unit we've looked briefly at the method study procedure for investigating and solving problems. You may feel that you'd like more training before you try the technique yourself but at least you have understood sufficient to enable you to make more of specialist work study staff. However, I hope you have found the techniques we've looked at are not too difficult to apply and that you may be able to use some of them as an aid in your present job.

You will be better able to

* IDENTIFY HOW METHOD STUDY CAN HELP YOU IN YOUR WORK AS A SUPERVISOR

As a supervisor you are in an ideal position to ensure that method study is successful. The workteam will be affected in their attitude to method study by their observation of you as the supervisor. If you think it is a waste of time they may also, if you co-operate there is a good chance that they will follow. By means of your understanding of method study you will be in a position to regard method study as an aid and as an opportunity to prove to management that you have ideas and abilities.

I hope that the work you have done was enjoyable and useful enough to encourage you to continue in your studies.

2 Extensions

I recommend that you take up as many of these extensions as you can. They will further increase your understanding and interest. You will also be able to check out a number of the ideas that I mention in the Unit. The extra time and effort will prove very worthwhile.

EXTENSION 1	Book:	Work Study
	Author:	R M Currie
	Publisher:	Pitman
EXTENSION 2	Book:	Work Study and Related Management Services
	Author:	Dennis Whitmore
	Publisher:	Heinemann
EXTENSION 3	Book:	Introduction to work study and statistics
	Author:	R G Seabourne
	Publisher:	Longman Supervisory Series
EXTENSION 4	Self Learning Unit:	Writing Skills
	Author:	D H Thomas
	Publisher:	Northern Regional Management Centre
EXTENSION 5	Self Learning Unit:	Controlling Output
	Author:	V B Prabhu
	Publisher:	Northern Regional Management Centre

These extension opportunities can all be taken up via your Support Centre.

They will either have the materials or will arrange that you have access to the materials. However it may be convenient to check out the materials with your Personnel or Training people at work - they may well give you access. There are other good reasons for approaching your own people, for example they will become aware of your interest and you can involve them in your development.

3 References

REFERENCE 1 British Standard: Glossary of Terms used in work study (BS 3138: 1979)

This reference can be taken up via your Support Centre. They will either have the materials or will arrange that you have access to the materials. However it may be more convenient to check out the materials with your Personnel or Training people at work - they may well give you access. There are other good reasons for approaching your own people, for example they will become more aware of your interest and you can involve them in your development.

If you do wish to make use of these references then don't think that you must read them right through. Just dip into them for a slightly wider treatment of the topic raised by the unit.

I should warn that the language and style of the writing is often difficult to cope with. So don't struggle with it too much. Do what I do when in difficulty, put the book back on the shelf and find a better one!

THE CHOICE SERIES

PRINCIPLES AND PRACTICE OF SUPERVISION

11 Needs and Rewards
12 Enriching Work
13 Workteams
14 Team Leading
15 Leading Change
16 Organisation Systems
17 Supervising in the System
18 Supervising with Authority
19 Workplace Control
20 Taking Decisions

TECHNICAL ASPECTS OF SUPERVISION

30 Looking at Figures
32 Using Graphs
33 Method Study
34 Easy Statistics
35 Quality Control
37 Controlling Output
38 Value Analysis
39 Quality Circles
40 Computers
41 Stores Control
42 Managing Time
43 Descriptive Statistics
45 Supervisors & Marketing

COMMUNICATION

60 Communicating
61 Speaking Skills
62 Writing Skills
63 Communication Systems
64 Orders and Instructions

ECONOMIC AND FINANCIAL ASPECTS

70 Accounting for Money
71 Control via Budgets
72 Cost Reduction
73 Wage Payment Systems
74 The National Economy

INDUSTRIAL RELATIONS

80 Training Plans
81 Training Sessions
82 Discipline and the Law
84 Health and Safety
85 Industrial Relations in Action
86 Equality at Work
87 Hiring People
88 Supervising and the Law